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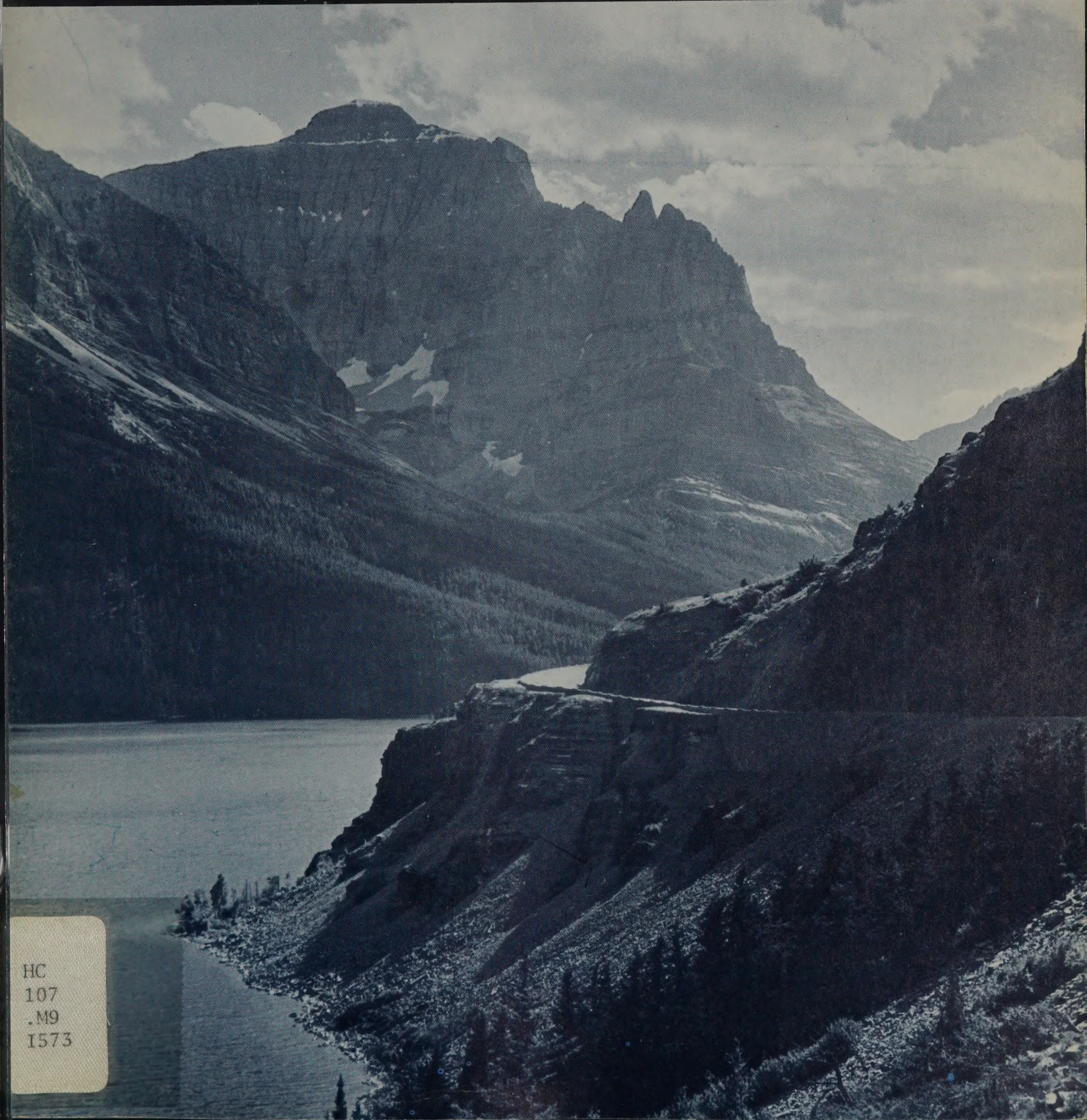
Natural Resources of

MONTANA

Prepared by the - United States Department of the Interior - Stewart L. Udall, Secretary



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(Front cover) Rugged crags rise above a mountain lake to form this view in Glacier National park.

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(Above) Wooded hills provide a setting of exceptional beauty for this western Montana trout stream.

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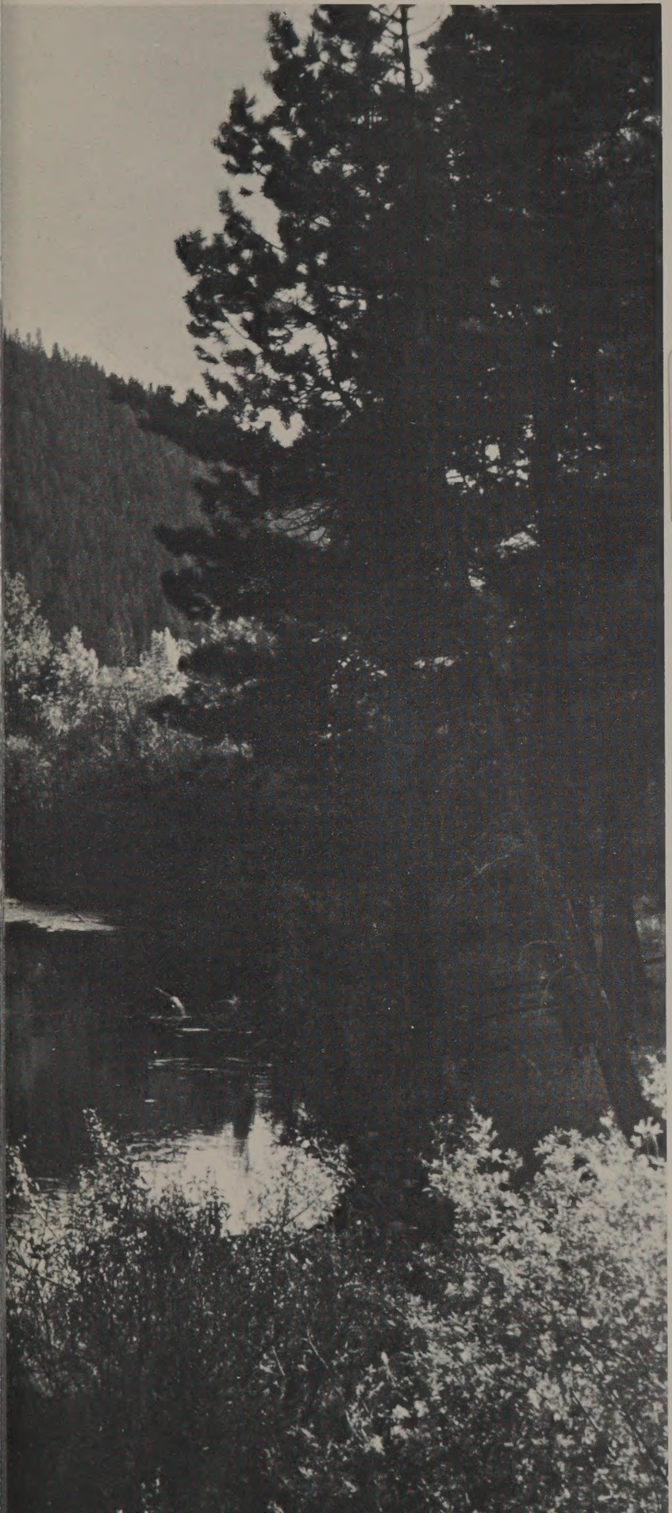

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Natural Resources of Montana

"The Treasure State"

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The purpose of this booklet is to bring a new awareness to the American people of our rich natural resource heritage, its history, its present, and its future. To know our land is to love it and cherish it and protect it from the ravages of both nature and man.

Stewart L Udall

SECRETARY OF THE INTERIOR

Contents

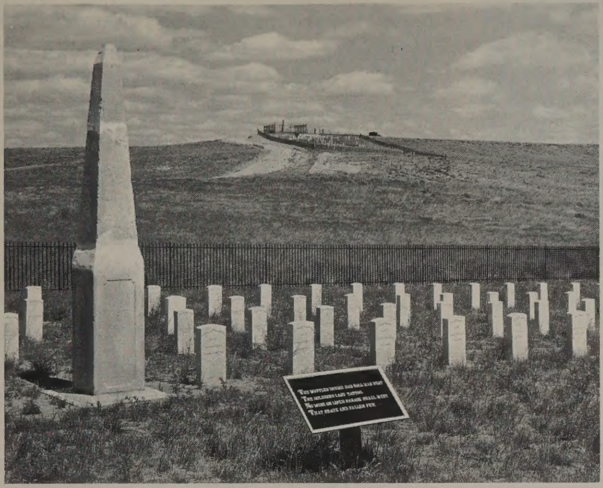
Page
Introduction and History 4
Physical Characteristics 9
Park and Recreational Resources 12
Fish and Wildlife Resources 20
Water and Power Resources 26
Mineral Resources 32
Land Resources 38
Indians and Their Resources 42
Programs of Federal Natural Resource Agencies 45
    U.S. Army Corps of Engineers 48
    Bonneville Power Administration 49
    Fish and Wildlife Service 50
    Forest Service 52
    Geological Survey 54
    Bureau of Indian Affairs 56
    Bureau of Land Management 57
    Bureau of Mines 60
    National Park Service 61
    Bureau of Outdoor Recreation 62
    Bureau of Reclamation 63
The Future 67

A restored mining town, Virginia City; the Custer Battlefield National Monumen

Introduction and History

Montana, "the Treasure State," can boast some of the most beautiful scenery, among the most concentrated mineral-rich acres, and one of the most swashbuckling political and social histories to be found in America.

Many noted authors have been stirred by the grandeur of the State's rugged ranges—by the vastness of its plains—by the whimsy of its climates and the flavor of its history. Within its borders, which could encompass three States the size of New York, dwell approximately



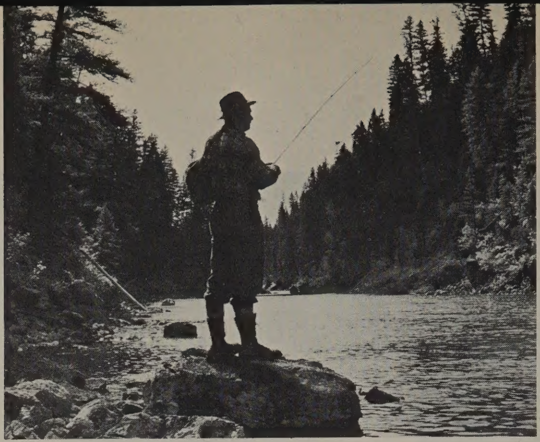
d a log fort reminiscent of the Indian wars, recall Montana's colorful past, while a modern oil refinery suggests its progressive future.

700,000 people—equivalent to about half the population of the Bronx.

Varied Resources

Vast lands suited to agriculture, fine native grasses, scenery, water, minerals, and timber are Montana's most valuable resources. More than $150 million worth of beef cattle graze on the nutritious grass—rich in protein, mineral salts, and carbohydrates. Sheep, which share the grassy bounty, are valued at over $40 million.

Named by the Indians "Land of Shining Mountains," Montana is big enough to include an incredibly varied landscape—from the level plains of the East to the crest of the Rockies in the West. Copper and silver lie hidden in the hills of the western half of the State, and it is here that several principal cities are clustered—Missoula, Helena, Anaconda, Bozeman, and



Famed Bob Marshall Wilderness area attracts rugged sportsmen from all over the Nation.

Butte. Annual mineral output is about $200 million, chiefly copper and petroleum.

Twenty-two and a half million acres of timber—ponderosa and lodgepole pine, western larch, fir and spruce—yield products worth about $90 million annually, with the Christmas tree industry a multimillion-dollar factor.

Six of Montana's fifty-six counties are bigger than the entire State of Connecticut, yet not one of its five major cities—Great Falls, Billings, Butte, Missoula, and Helena—has a population of over 60,000.

The majestic ponderosa pine is the State tree; the western meadowlark the State bird. The State flower, bitterroot, with its clusters of narrow leaves and pink or white flowers, was held in such high regard by the early Montana Indians that they named a river and a mountain range after it.

The State motto, "Oro y Plata" means "gold and silver" in the language of Spanish explorers.

Early Years

In 1743, the French father and son La Verendrye, who swung through southeast Montana, were the first white men to sight the peaceful grass-rich country and to record the Big Horn Mountains. The part of Montana east of the Rockies was purchased by the United States from France in 1803 and was explored by Meriwether Lewis and William Clark in 1805 and 1806. West of the Continental Divide, they examined in Montana only the Bitterroot and Lolo Valleys, a part of the Clark Fork Valley of the Columbia, and the Big Blackfoot Valley—then a part of Oregon Country over which Britain and the United States contested for the next 40 years. In 1807, Manuel Lisa, a fur trader, built Montana's first trading post. The first permanent white settlement was St. Mary's Mission, founded in 1841.

Small discoveries of gold as early as 1852 in the Bitterroot Valley and at Gold Creek on the Clark Fork of the Columbia River brought the beginnings of heavy immigration to Montana.

James and Granville Stuart "rediscovered" gold on Gold Creek and the start of operations there in 1860 began the development of Deer Lodge Valley. John White, on his way to the gold fields in 1862, stumbled on the Grasshopper Creek placers where Bannack was founded. The next year Henry Edgar, Bill Fairweather, and others discovered the even richer lodes of Alder Gulch, where Virginia City and other soon-dead "cities" were established. In 1864, John Cuvan located Last Chance Gulch north of these holdings, where Helena, eventually to become the State capital, put down its roots.

The rip-roaring cast of characters attracted to the rich diggings made responsible government essential. In 1863, the Idaho Territory, which included Montana, was formed, and the following year the Montana portion was broken off and given territorial status of its own. Its capital was Bannack and the former chief justice of the Idaho Territory, Sidney Edgerton, was first Governor.

The early years of the new Territory were marked by violence and rough-and-ready vigilante justice. From this period comes the legend of Thomas Francis Meagher, acting Governor after Edgerton and one of the most colorful characters of the early west.

Economic Gains

With the ebb of violence, Montana moved ahead rapidly, both in population and wealth. From fewer than 100 white persons in 1860, the area population shot to 143,000 in 1890. By 1870 approximately $100 million in gold had been taken out by placer mining and, when the placers were exhausted, quartz mining emerged. Gold and silver continued as the chief metals until 1880, when copper overtook both.

From this rich metal-mining period, which lasted well into the 20th century, came the State's wealthiest men. Helena was reputed to have more millionaires per capita than any other city in the world.

As metal production leveled off, new investment opportunities were developed—lumber, cattle, sheep, railroads. Montana was becoming one of the most luxurious communities on the frontier. This luxury manifested itself in two extremes—in the culture to be found in well-built, tastefully furnished homes, and in the ornate gambling houses and saloons.

Indian hostilities, which began in the 1860's, continued into the 1870's and reached two tragic climaxes. In 1876, Gen. George A. Custer and all the troops in his command were killed by Sioux and Cheyenne in the Battle of the Little Bighorn. In 1877, Chief Joseph surrendered his Nez Perce band to Gen. Nelson A. Miles after a running battle through Montana from the Bitterroot Valley to the Bear Paw Mountains. This event marked the end of major Indian wars in Montana.

A liberalized land policy and the completion of two railways—the Northern Pacific in 1883 and the Great Northern in 1893—caused homesteaders to flock to Montana. The Carey Land Act of 1894 set aside 1 million acres of land in each public-land State to be used for irrigation and reclamation. Between 1890 and 1900, population jumped from 143,000 to 243,000.

Statehood

In 1887, Congress had passed legislation prohibiting "aliens" from owning any real properties in the Territories. Instantly, the foreign capital, most of which had come from England to finance the mining, smelting, and refining of copper, ceased to flow. The prohibition, which did not apply to the States, gave impetus to Montana's application for statehood. Desperate for financing to develop their costly mineral ventures, Montanans dropped their nearly total autonomy and joined the Union November 8, 1889, as the 41st State.

Montana's first State Governor was Joseph K. Toole. The territorial capital had been moved from Bannack to Virginia City in 1865, and then to Helena in 1875. Helena retained its title as capital of the new State, but only after two bitter referendums in which it was challenged by several other cities.

Montana's copper-domed capitol in Helena is visited by thousands of people annually.

Montana Today

Although small in comparison to other State populations, Montana's population is increasing rapidly. In 1950 it had 591,000 persons; by 1960 this had risen to nearly 700,000. Per-capita personal income is among the upper third of the States; the level of formal education exceeds the national average; its many churches, civic, community and fraternal organizations are more than adequately supported. Cities today are modern, growing, and bear small resemblance to the "wide open" towns of Montana's earlier years. Opportunities for outdoor recreation are among the Nation's finest.

Reinstitution of the State planning board in 1955 has given the State a clearinghouse for industrial development projects. It also coordinates plans for area redevelopment programs.

Irrigation, power, and flood control—multiple uses of water resources—have come into their own in Montana. The Department of the Interior's Bureau of Reclamation and the U.S. Army Corps of Engineers have been responsible for such developments as Hungry Horse, Canyon Ferry, and Fort Peck. Kerr Dam and Noxon Rapids Dam are among projects developed by private utilities.

In the fourth largest State in the Union, which has but four persons per square mile—there is a sense of spaciousness. It is a refreshing, renewing sense that is the flavor of Montana—Land of the Big Sky.

Alternation of mountain range and valley is common in western Montana. These majestic peaks rise out of St. Mary's valley in Glacier National Park.

Physical Characteristics

In Spanish, *montana* means mountainous, and western Montana well deserves the name. Yet the eastern two-thirds of the State levels from the mountains to a rolling plains area.

Geologic History

The oldest rocks now exposed in the ranges of southwestern Montana are so altered and deformed that little of their early history can be reconstructed. Measurements of radioactivity show that they are more than 1.5 billion years old. These primeval rocks were worn down by erosion and then were flooded by the sea.

For eons the western interior of the North American Continent lay beneath the broad but shallow sea that extended unbroken from Alaska to the Gulf of Mexico. The mud and sand washed in by streams and deposited on that ancient sea floor hardened to bright green, red, yellow, and gray rocks that are now exposed in northwestern Montana.

More than 600 million years ago western Montana emerged from the sea and for about 50 million years was eroded by weather and streams. Then the sea returned, spreading into Montana from waterways to the west. To the summer tourist crossing the dry, hot plains of Montana, it is all but inconceivable that this area once lay under water. Yet the geologic history of Montana, as recorded by rocks and the fossils preserved in them, offers proof that most of the State, both plateau and mountain, stood submerged beneath the sea for hundreds of millions of years.

For more than 450 million years the shore of this western sea oscillated slowly back and forth across Montana as the land gently rose and fell. The rocks deposited beneath the sea during this interval, and those deposited on the land during episodes of emergence are now exposed in or underlie most of Montana.

About 100 million years ago this great pile of layered rocks began to crumple, as though squeezed in a gigantic vise. During many millions of years the rocks were folded, pushed over one another and broken, while the whole mass was slowly raised. The sea was forced to withdraw. This uplifted mass of contorted rocks formed the ancestral Rocky Mountains.

While these rocks were being squeezed and raised, enormous volumes of molten granite oozed from below into the growing mountains. Most of this molten rock hardened before reaching the surface, and can now be seen only where the overlying rocks have been worn away.

Landforms of Today

The main landforms of today—the Rocky Mountains and the Great Plains—were already established 50 or 60 million years ago. Neither the mountains nor the plains have remained still since; the whole region has been lifted thousands of feet above sea level. In western Montana, blocks of the uplifted stretched crust have settled unevenly to become the long valleys separating the mountain ranges.

The boundary between a valley and the flanking mountain range is generally a large fault, a break in the rocks along which the crustal blocks move a little at a time. The earthquakes that sometimes shake western Montana arise from slippage along faults.

From the moment the land rose from the sea it was attacked by weather and running water. Slowly the western mountains have been sculptured and most of the resulting debris dumped on the eastern plains. Some rubble was trapped en route to build up the flat floors within the mountain valleys.

The western mountains are part of the Rocky Mountain chain that extends from Canada through Idaho, Montana, Wyoming, Colorado, and New Mexico, and into Mexico to form the backbone of the continent. From the air, the whole appears as a complex of northward-trending forest-covered ranges, each separated from its neighbor by a ribbon of lighter colored grass-floored valleys. Large rivers wind through these valleys, and the major highways and rail lines follow the rivers.

This alternation of mountain range and valley has served western Montana well, for the valleys, floored by rich soils, well supplied with ground and surface waters, and protected by the mountains from the fierce winter storms, are important agricultural centers. The grain-rich Gallatin Valley is flanked by the Madison and Bridger Ranges; the Bitterroot Valley, perhaps Montana's best fruit-growing area, is sheltered by the Sapphire Mountains on the east and the Bitterroot Range on the west. In like fashion, the Madison Valley, filled with broad pastureland, lies between the Madison and Jefferson Ranges.

As mountains go, the Montana ranges are not high—but they are rugged. A few peaks reach over 12,000 feet, but most are between 8,000 and 11,000 feet. In fact, Montana's average altitude of about 3,400 feet is lower than most Rocky Mountain States. More than half the State is below the 3,000-foot mark. Scattered across the plains and breaking the monotony of the wheat fields that seem to stretch to the horizon, are isolated mountain groups with evocative names—the Sweet Grass Hills, the Bear Paw Mountains, the Big Snowy Mountains, the Little Rockies, the Crazy Mountains.

Mountain Cores

The largest exposed masses of rock are the core of the 70-mile-long Bitterroot Range on the Idaho border and the Elkhorn Range along the Continental Divide. Most of the rich mineral deposits of western Montana are in or near these granite bodies. In places the molten rock broke through to the surface, either quietly as thick lava flows or explosively as gaseous clouds laden with volcanic ash. The land was buried time and again by these eruptions, until enormous piles of volcanic rock were built. Those extant flank the Elkhorn Range.

Ice Sheets

About a million years ago, sheets of ice spread south from Canada in recurrent advances across the plains of northern Montana. As the ice front melted, the clay, gravel, and boulders gathered and carried by the ice were dumped to form gumbo till—when wet the despair of farmers. Elsewhere, meltwaters sorted the debris to form valuable sand and gravel deposits.

Glaciers also formed in the main mountain valleys. Some glaciers spread far enough to join and finally bury whole mountain ranges. The mountain glaciers changed the scenery profoundly, sharpening ridge crests, rounding valley heads, deepening and straightening valleys. They dumped debris on valley floors and at canyon mouths to leave behind innumerable waterfalls and lakes.

Today, Montana's mountains and plains are being dissected by streams, which deepen their canyons by scooping rock waste out of the valleys and moving it toward the ocean.

Plains Area

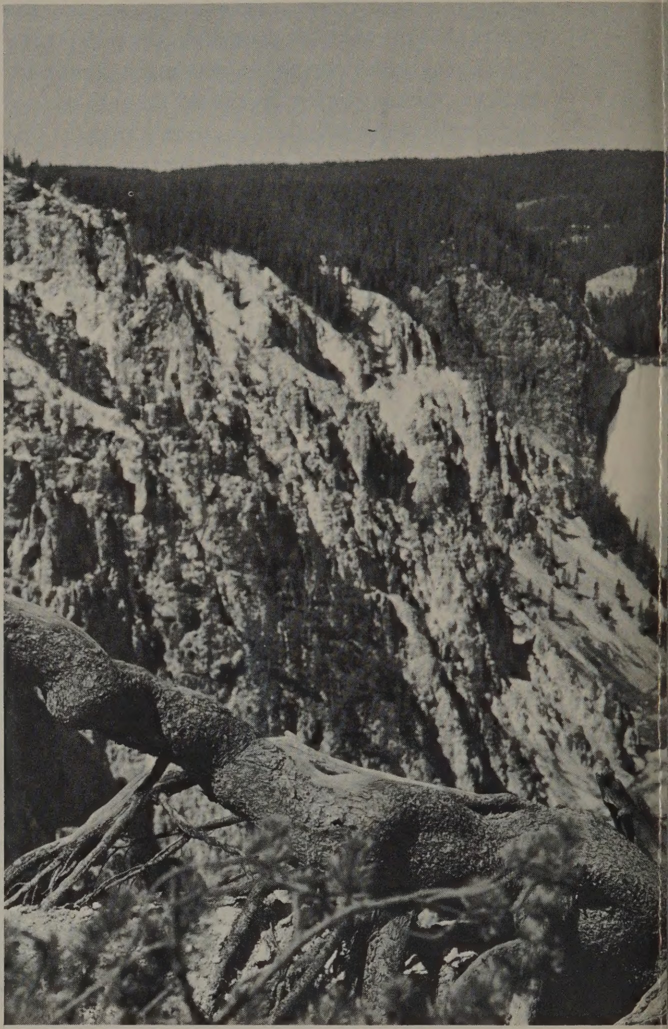
East of the mountains, the broad plains slope gently toward the rising sun. They are intricately dissected and drained by the Missouri River and its myriad tributaries, most notably the Yellowstone. Many of the tributaries to these two major streams bear the stamp of the 1804–06 Lewis and Clark expedition: the Marias, named by Meriwether Lewis after his cousin Maria Wood, the Judiths, named by William Clark for his fiancée Miss Julia (Judy) Hancock, and Clark Fork of the Yellowstone, which Captain Clark "ventured to name for himself," and which should not be confused with the Clark Fork of the Columbia in northern Montana.

The Missouri River swings in a broad arc through the central and northern parts of the State. This great river is formed at Three Forks by the union of three other rivers that have their source on the Yellowstone Plateau and drain the east flank of the Rocky Mountains. These rivers—the Jefferson, Madison, and Gallatin Rivers—were named by Lewis and Clark for the men who were then, respectively, President, Secretary of State, and Secretary of the Treasury. The Missouri rushes through canyon country northward to Helena, the State capital, and then turns eastward to flow across the plains past Great Falls.

The Yellowstone River rises in northwestern Wyoming, flows into Yellowstone Lake in Yellowstone National Park, and then churns into southern Montana over spectacular falls, rapids, and through deep canyons. Near Livingston it pours out on the plains and wanders northeast to join the Missouri just across the State line in North Dakota.

A butte stands out of the prairie. The level plain is characteristic of much of Eastern Montana.

Park and Recreational Resources



Whatever his outdoor pleasure, the recreationist in Montana can find it in the natural grandeur in national parks, mountain lakes, streams, and trails in national forests, wildlife refuges, colorful pageantry on Indian reservations, and monuments to history. Montana offers spectacular recreational opportunity from swimming to skiing, hiking to hunting, boating, camping, and just relaxing.

Montana has more than a score of State parks with total acreage of about 10,000. There are about 130 municipal and county parks.

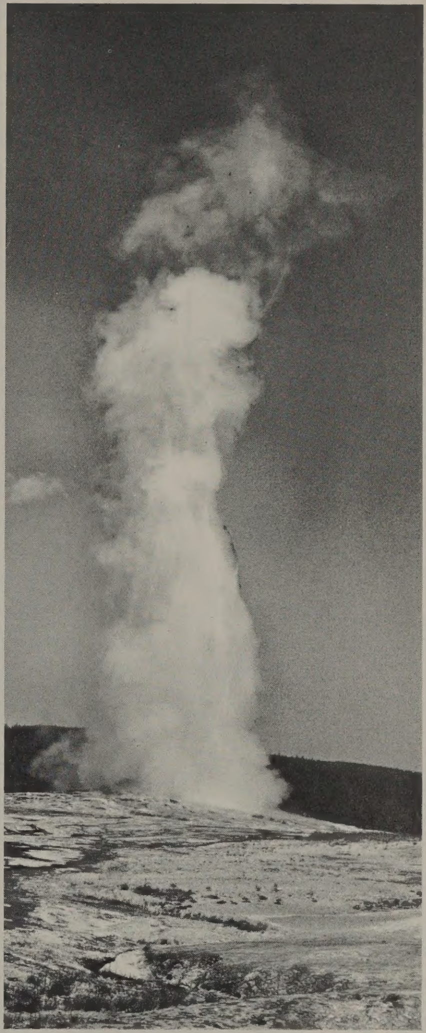
Areas of Interest—Federal

Custer Battlefield National Monument is the site of the famous Battle of the Little Bighorn. There, on June 25 and 26, 1876, Gen. George Armstrong Custer and his men made their last stand. He and all 265 members of his 7th U.S. Cavalry were wiped out by the Sioux and Northern Cheyenne Indians under Chiefs Sitting Bull and Crazy Horse.

The battlefield is near the Crow Agency and Hardin at the junction of Montana Highways 87 and 212 on the Crow Reservation.

Big Hole Battlefield National Monument stands as a tribute both to the U.S. soldiers who gave their lives here and to the Indians they fought—Chief Joseph and his Nez Perces. The original rifle pits, a museum, the soldiers' memorial monument, and the Chief Joseph Memorial tell

Yellowstone National Park, of which Old Faithful Geyser and the Lower Falls of the Yellowstone River are spectacular features, lies partly in Montana and extends into Wyoming and Idaho.



the story of one of the more dramatic and tragic episodes in the struggle of the white man to confine the Indians to ever-diminishing reservations and to force them off land wanted by the whites. Chief Joseph's retreat ended August 10, 1877, in sight of Canada, when U.S. troops caught the Nez Perces at Bears Paw Battlefield near Chinook.

The battlefield is in western Montana, 12 miles west of Wisdom, on Montana Highway 43, and 21 miles southeast of U.S. 93.

Fort Peck Dam and Reservoir, 10 miles from the Fort Peck Indian Reservation near Nashua, are in northeast Montana. Fort Peck is one of the world's largest earthfill dams and lies off U.S. 2, near Glasgow. A highway follows the crest of the dam and leads to a mile-long concrete spillway. An information center is open from May to October. (See further description, p. 14).

Hungry Horse Dam, near Hungry Horse off U.S. 2, is the world's fourth largest concrete dam, set in a wooded canyon near Glacier National Park. Self-guided tours are available throughout the summer.

Glacier National Park lies athwart the Rocky Mountains of northwestern Montana. It is on U.S. 2 and 89. The park was established by Congress in 1910 and contains 1,009,159 acres joined on the north by Canada's Waterton Lakes National Park of 118,800 acres to form Waterton-Glacier International Peace Park.

In this wilderness area, visitors can enjoy spectacular mountain scenery—lofty peaks, sheer cliffs, sparkling waterfalls, gleaming lakes in forested valleys, and ancient glaciers from which the park gets its name. Sixty glaciers move slowly down the slopes, remnants of the mighty icefields of the past. Jackson Glacier is one of the glaciers visible from the road in the park and can also be viewed from Going-to-the-Sun Highway, a spectacular 50-mile drive through the park.

Glacier Park has 1,000 miles of horseback and walking trails. Many of them are self-guided nature routes. Several glaciers can be visited readily. July and August are the best hiking months; August is preferable for high-country trips. Hikers should be wary of bears.

Yellowstone National Park, established by Congress in 1872. It is the largest and oldest of the national parks and has three of its five entrances in Montana. The north entrance at Gardiner is reached by the historic Yellowstone River route through spectacular Paradise Valley and Yankee Jim Canyon. Two scenic highways lead to the west entrance at West Yellowstone, Montana. The Red Lodge-Cooke City Highway to the park's northeast entrance climbs to 11,000 feet in the Beartooth Mountains. At all the Montana entrances, accommodations are available the entire year; accommodations are available in the park itself from about May 1 to October 31.

Yellowstone is one of the largest wildlife sanctuaries in the world. Best known of all the animals are the park bears. They are engaging but wild, and visitors are cautioned not to feed or molest the bears.

Lewis and Clark reported seeing grizzlies in 1805; one of the huge beasts chased Lewis into the Missouri. As guns improved and the price of pelts increased, the grizzly population dwindled. Now many of the remaining 200 or so live in the security of Yellowstone and Glacier National Parks.

Yellowstone's bird population includes some 200 species. The rare bald eagle, ospreys, gulls, and pelicans are often found near rivers.

The largest body of water in North America at so great an altitude—Yellowstone Lake—lies 7,731 feet above sea level and covers about 89,000 acres. At its outlet is Fishing Bridge, a favorite spot for anglers. The Grand Canyon of the Yellowstone is lovely at any time of day. It alone is well worth a trip to the park.

Interpretive services include guided nature walks along forest trails. Informal campfire programs are given each evening at Mammouth, Madison Junction, Old Faithful, West Thumb Lake, Fishing Bridge, Canyon, and Roosevelt lodges. Museums are throughout the park.

National Bison Range

A national wildlife refuge, the national Bison Range at Moiese, off U.S. 93 and U.S. 10–A, is one of the few places where bison or buffalo can be seen roaming the range. This 19,000-acre preserve is home to a herd of 500 bison as well as elk, deer, and pronghorn antelope. Bison can be viewed year round at an exhibition pasture. Inquiries may be directed to the manager at Range Headquarters, Moiese. Visitor facilities on this range were improved under an Accelerated Public Works program.

Indian Reservations

Blackfoot Reservation near Glacier National Park and Hungry Horse Dam contains a museum of the Plains Indians. Here the annual Blackfoot Medicine Lodge Ceremonial and Sun Dances take place.

Fort Belknap Reservation in north-central Montana, near Harlem, includes the St. Paul Jesuit Mission, a scenic natural bridge, Monument Peak, old goldmining towns, and annual dances in summer.

Fort Peck Reservation near Nashua in northeast Montana is the scene of Wolf Point wild-horse stampede in July.

At Fort Peck Reservoir, an Army Corps of Engineers project, outdoor recreation is an important feature. Nearly 246,000 persons use the recreation facilities annually, despite the short season.

The lake boasts a 1,520-mile shoreline, with 26 access points and 5 public launching ramps for watercraft. Ten picnic areas, 5 swimming beaches, 100 tent spaces, 1 restaurant, and 1 organized camp complete the list of facilities.

Flathead Reservation—Indian villages, scenic

Madison Range in Gallatin National Forest offers exciting scenery.

Flathead Lake, old Fort Connah, Fourth of July Indian celebration, Homesteaders' Day, Annual Copper Cup Regatta on Lake Flathead, and annual rodeos are principal attractions of this reservation, located in the northwest near Missoula and Kalispell.

Crow Reservation, southern Montana near Billings, is the burial place of Chief Rocky Boy. Old gold mine diggings abound, and Centennial Mountain Lookout offers a spectacular view of the Great Plains. The annual Cree Sun Dance is held in June and July, and the Crow Ceremonial in mid-July.

Northern Cheyenne Reservation is in southeast Montana, east of Hardin. The Annual Sun Dance and horse show and rodeo around Memorial Day are the principal attractions.

Glacier National Park is one of the Nation's most inspiring areas. Popular Two Medicine Lake is in the foreground.

State Wildlife Refuges

Montana's many refuge areas have a controlled program of hunting and fishing. Big-game hunting as well as upland and waterfowl game offer the outdoor lover an exciting recreation challenge. Montana's numerous fisheries permit angling in certain areas.

Accessibility to Montana's hidden lakes and streams is a problem which future modes of travel may resolve. However, they can be reached on horseback or on foot, even though the travel is rugged. A satisfying reward awaits the traveler, not only in the "catch" but also in the discovery of his own "secret" fishing hole.

Scenic Highway

From its junction with U.S. 93, 11 miles south of Missoula, the Lewis and Clark Highway leads westward up a narrow valley of farmland, over a 5,233-foot-high pass, and along the edge of the Selway-Bitterroot Primitive Area, to Kooksia, from which westbound traffic continues to Lewiston, Idaho, and southbound traffic to U.S. 95 at Grangeville, Idaho.

Cutting 100 miles from the previous route between Missoula and Lewiston, the new highway gives access to the recreation opportunities of the wilderness and provides a short cut for cross-country travel.

The country through which the highway passes is virtually undeveloped—most of it being in the Lolo and Clearwater National

Forests. Facilities on the road are most suitable to camping, hunting, and fishing parties. For most of its length the highway follows the clear, lovely river which Lewis and Clark named the Koos-koos-kee, through heavy stands of timber, with occasional views of the high mountains rimming the canyon. The few lodges of the area, having existed on the local patronage of hunters, campers, and fishermen, are attempting to reorient their services toward the needs of tourists who want to savor the qualities of wilderness life and genuine western atmosphere.

Forests

Montana offers the recreationist and nature lover more than 16 million acres of national forest land administered by the Department of Agriculture's Forest Service. In a typical year, some 5½ million recreationists enter Montana's national forests which are among the most inviting treasures in the Treasure State.

Beaverhead (2,130,936 acres) with headquarters in Dillon, includes a 55,000-acre portion of the Anaconda-Pintlar Primitive Area. Mountain ranges in the forest include: Tobacco Root, Madison, Gravelly, Snowcrest, and the Continental Divide. The recreationist can find fishing; hunting for deer, elk, moose, and other game; hot springs; scenic drives; and wilderness trips. There are dozens of campgrounds and picnic sites and one ski area—Rainy Mountain.

Bitterroot (1,113,814 acres in Montana and 460,812 acres extending into Idaho) has headquarters at Hamilton. More than 290,800 acres of the Selway-Bitterroot Primitive Area lie within this forest. Also, a 40,000-acre portion of the Anaconda-Pintlar Primitive Area is found here. Spectacular scenery is provided by the Bitterroot Mountain and Bitterroot Valley with scores of mountain lakes and hot springs. Lake and stream fishing are excellent and hunters may stalk elk, deer, and mountain goat. There are 20 campgrounds and picnic areas and 1 winter sports area, the Lost Trail.

Custer (1,097,784 acres in Montana and 73,707 acres in South Dakota) has headquarters in Billings and includes 175,000 acres of the Beartooth Primitive Area. Hundreds of lakes, 900-foot Woodbine Falls, glaciers, and ice caverns add to the majesty of this forest, which includes 12,962-foot Granite Peak, highest point in

(Above) A cross-country skier, enjoying a popular sport, pauses for a refresher. (Below) Boating enthusiasts test their craft on the Lower Missouri River in eastern Montana.

Montana's parks and forests attract many thousands of campers annually. This scene is in Glacier National Park.

Montana. Here, too, are fossil beds, Indian hieroglyphics and burial grounds, the Red Lodge-Cooke City Scenic Highway, Willow Creek Ski Area, and about 30 camp and picnic grounds.

Deerlodge (1,134,572 acres), with headquarters at Butte, includes a 49,940-acre portion of the Anaconda-Pintlar Primitive Area and numerous alpine lakes. Lakes and streams abound with fish and big game hunting is good. Cabel Mountain Ski Area and about 30 campgrounds and picnic areas are among the many attractions.

Flathead (2,336,388 acres) has headquarters at Kalispell. This forest encompasses 710,000 acres of the Bob Marshall Wilderness Area and the 73,340-acre Mission Mountains Primitive Area. Here geological formations include the massive Chinese Wall and jagged Mission Mountains, hanging valleys, glaciers and scores of glacial lakes. Activities include fishing, big-game hunting, boating, canoeing, riding, wilderness trips, and scenic drives. Facilities include about 20 campgrounds and the Big Mountain ski area.

Gallatin (1,700,139) in southwest Montana, with headquarters at Bozeman, includes the 64,000-acre Absaroka Primitive Area, the 49,800-acre Spanish Peaks Primitive Area, and 55,000 acres of the Beartooth Primitive Area. The forest offers more than 200 lakes and thousands of miles of fishing streams, the Gallatin Valley, Crazy Mountains, 11 outstanding waterfalls, and the Madison River Canyon Earthquake Area. Facilities include about 60 campgrounds and picnic areas and the Bridger Bowl and Lionhead ski areas.

Of special interest to tourists is the Madison River Canyon Earthquake Area at Gallatin. Scene of the earthquake and landslide of 1959, the area has been visited by over 1 million persons.

Helena (966,613 acres), with headquarters in the city of the same name, encompasses the 28,562-acre Gates of the Mountains Wild Area, within which are limestone cliffs and Indian writings. Visitors may take boat trips through this wild area on the Missouri River. Facilities include nine camp and picnic areas and the Grass Mountain Ski Area.

Kootenai (966,613 acres in Montana and 48,851 acres in Idaho) has headquarters at Libby. A 42,900-acre portion of the Cabinet Mountains Primitive Area is found here, and there is excellent fishing and hunting. The forest's recreation facilities include nearly 20 campgrounds and 1 ski area—the Turner Mountain.

Lewis and Clark (1,862,018 acres), with headquarters at Great Falls, includes 240,000 acres of the Bob Marshall Wilderness Area. Attractions include the Continental Divide and Chinese Wall, scenic limestone canyons, and rolling mountains with many open glades. Facilities include about 20 campgrounds and the Kings Hill ski area.

Lolo (2,076,641 acres in Montana and 426,062 acres in Idaho) has headquarters in Missoula. This forest includes stream and lake fishing, hunting, scenic drives, wilderness pack trips, and saddle and foot trails to 100 lakes and peaks. Facilities include more than 20 campgrounds and picnic areas and 1 ski area, the Snow Park.

Kaniksu (491,376 acres in Montana) has its headquarters in Sandpoint, Idaho. The Woodchuck Mountain ski area is in the comparatively small Montana portion of this forest.

Privately Owned Recreation Facilities

Privately owned recreation facilities are of major importance in Montana. These vary from resident summer camps for boys and girls to fine hunting areas. The State's crop and pasture lands contribute significantly to the supply of outdoor recreation opportunities. Many persons operate vacation farms, or ranches, offering lodging for tourists. Others lease or supply hunting opportunities, often providing cabin facilities as well. Camping, picnicking, fishing, hiking, horseback riding, and guide services are also provided by some. Many lease or sell scenic sites for home and camp lots.

Travel bureaus and agencies, commercial organizations such as petroleum companies, motel and hotel associations, airlines and railroads, local chambers of commerce and outdoor organizations and clubs can supply information on many of the privately owned facilities. Local inquiry will reveal others. Information also is available from the Advertising Director, Montana State Highway Commission, Helena.

A dinner cooked in the open makes a perfect ending for a day's hunting. Montana's abundant game resources attract outdoorsmen.

Fish and Wildlife Resources

Bears are seen frequently in Yellowstone, but visitors are warned not to approach them.

The Big Sky Country beckons the hunter, fisherman, and other outdoorsmen with sport as diverse as the scenic settings in which it is found. Pronghorn antelope, deer, grouse, and a variety of fish are among the wildlife of the

In a State famous for its fine hunting, elk yield prize trophies. One of the Nation's largest elk herds is in the Sun River area.

Montana has more than 5,000 acres of State-owned fishing areas.

A fisherman tries his luck in the Shields River, near Livingston.

eastern prairies and rivers. Elk, moose, and black and grizzly bear roam the western mountains and valleys.

Montana has over 1,500 lakes and approximately 15,000 miles of fishable streams, including 31 major rivers. In addition, the Treasure State has many hundreds of manmade reservoirs. Most of these have been stocked and provide good fishing.

The tributaries and connecting lakes of

Montana's four major watersheds offer a variety of fishing found in few other States. The Yellowstone River's headwater streams, especially those originating in Yellowstone Park and Beartooth Mountains, are excellent for cutthroat trout fishing. In Park, Sweetgrass, and Stillwater Counties the prized rainbow and brown trout abound. These three counties are also noted for fine catches of whitefish. The higher summer temperatures of the Yellowstone River in Yellowstone County provide good warm-water catches of sauger, walleye pike, channel catfish, freshwater drum, and ling.

Headwaters of the Missouri River have grayling, and cutthroat, rainbow, brook, and brown trout; the lower stretches offer sturgeon, sauger, walleye and northern pike, sunfish, crappie, and yellow perch. All the important tributaries offer opportunities for both warmwater catches and coldwater sport.

The Clark Fork of the Columbia, west of the Continental Divide, and almost all its tributaries offer fine trout fishing. Fishermen also can find good trout fishing and equally good bass angling where the Big Blackfoot River meets the Clearwater River. The landlocked variety of sockeye salmon, or kokanee, has been stocked in several lakes.

The Kootenai River in northwest Montana has several outstanding streams and smaller tributaries which abound with cutthroat, eastern brook, rainbow, and Dolly Varden trout.

Montana's great size gives hunters plenty of room to search for game—elk, deer, bear, mountain goats, mountain sheep, moose, or pronghorn. The best elk hunting usually requires packing into rugged back country, although many elk have been taken by roadside hunters and those willing to travel short distances on foot. One of the largest herds in the Nation is in the Sun River area with access points at Choteau, Wolf Creek, Valier, and Augusta.

Mule deer are the most abundant of Montana's big-game animals and can be found from the brushy draws of the eastern prairies to the timberline in the mountainous areas of the western portion.

White-tailed deer, usually found in heavily timbered or brushy areas, privide a real test for sportsmen. The northwestern section of Montana offers the best hunting for this wary animal, although the white-tailed deer is fairly abundant in several of the large river-bottom areas in eastern Montana, particularly along the Missouri and Yellowstone. Black bear and its color phases of brown and cinnamon are hunted in Montana.

Hunting of the grizzly bear is usually restricted to fall. Good grizzly hunting areas are the north, south, and middle forks of the Flathead River, and the Absaroka Wilderness north of Yellowstone Park.

The mountain goat and sheep population has been built up in Montana and special license hunting is allowed. Present populations indicate controlled hunting will continue.

Largest member of the deer family is the moose, which offers hunters in Montana a rare challenge. Most of Montana's moose population is in the southwest near Ravalli, Granite, Powell, Beaverhead, Madison, Gallatin, Sweetgrass, Stillwater, and Carbon Counties. Other moose hunting areas are the Bob Marshall Wilderness in eastern Flathead County and three areas in Lincoln and northern Flathead County.

Pronghorn antelope beckon many hunters. They range from the eastern Montana prairie to the foothills of the Continental Divide. Not only is pronghorn meat a delicacy, but the trophy-minded hunter can add a fine head to his collection. Licenses have increased from 750 in 1943 to many thousands today. Major pronghorn areas include Carter, Powder River, Custer, Golden Valley, Garfield, and Rosebud Counties.

Nearly all Montana upland game bird hunters place the various grouse species, gray partridge, and ring-necked pheasant at the top of their wingshooting list. Today the mainstays of Montana grouse hunting are the sharptail and sage grouse of the eastern plains. In the mountains of the west are found the ruffed, blue, and spruce grouse. The spruce or "Franklin's" grouse, one of Montana's finest game birds, is associated with spruce and lodgepole forest

Northwestern Montana offers excellent deer hunting. A telephoto-equipped camera caught this white-tailed buck an instant before he leaped away.

and is usually found near water. Its gullible nature has earned it the name of "fool hen." The sage grouse is the largest representative of this group, with the cocks averaging 5½ pounds.

Two species of partridge, the gray and the chukar, are hunted in Montana. Wild turkeys were released in 1955 and, through trapping and transplanting, turkey flocks have expanded beyond the hopes of biologists working on the program.

Ring-necked pheasants supply more hunting than any other Montana game bird. Excellent hunting areas are in the lower Flathead Valley, the Sun River Irrigation Project, the irrigated croplands near Conrad and Valier, the lower Yellowstone Valley, and the Milk and Musselshell Rivers.

Birds from two flyways pass through Montana on their way to southern wintering grounds and offer some of the best hunting found along any of the flyways.

Perhaps the best duck hunting is along the high line of the north-central section of the Milk River drainage. Good duck hunting is also found in water areas of the western mountains. Among puddle ducks the nimrod will find mallards most abundant. Canvasbacks, scaup, and redheads make up the bulk of diving ducks found in the State.

Canada geese are most plentiful in Montana's wild goose population and the beautiful snow goose is found in surprising numbers throughout the central part of the State. The northeast corner of the State near Plentywood is good for hunting the white-fronted goose. The trumpeter swan, in flight often mistaken for a snow goose, has made a gratifying comeback in the

Bison cross the Mission River on the National Bison Range near Moiese. About 500 bison live on this preserve.

Red Rock Lakes National Wildlife Refuge.

The mallard is first in importance in the duck hunter's bag in Montana, followed by blue-winged teal, green-winged teal, and pintail. Of lesser importance are scaup, baldpate, shoveler, and gadwall.

Forests Open to Hunting and Fishing

National: Beaverhead, Bitterroot, Custer, Deer Lodge, Flathead, Gallatin, Helena, Kaniksu, Kootenai, Lewis and Clark, and Lolo.

State: Clearwater, Coal Creek, Lincoln, Stillwater, Sula, Swan River, and Thompson River.

Public lands administered by the Department of the Interior's Bureau of Land Management are open to hunters and fishermen. These public lands are important areas for sportsmen. Many public land areas support large populations of big game. In certain areas the stream-side lands are privately owned and access is not readily available to hunters and fishermen.

State Public Hunting and Fishing Areas

State public hunting areas in Montana include nearly 60,000 acres in game range purchased and an equivalent acreage of leased game range. Waterfowl management areas purchased total more than 10,000 acres with an additional 17,501 acres leased. One, Freezeout Wildlife Management Area, is operated as a specific public hunting ground while all others are open to hunting.

There are more than 40 fishing access areas totaling some 5,000 acres State-owned. In addition, more than 23,000 acres are leased for public fishing in Montana, including streams and lakes.

Water and Power Resources

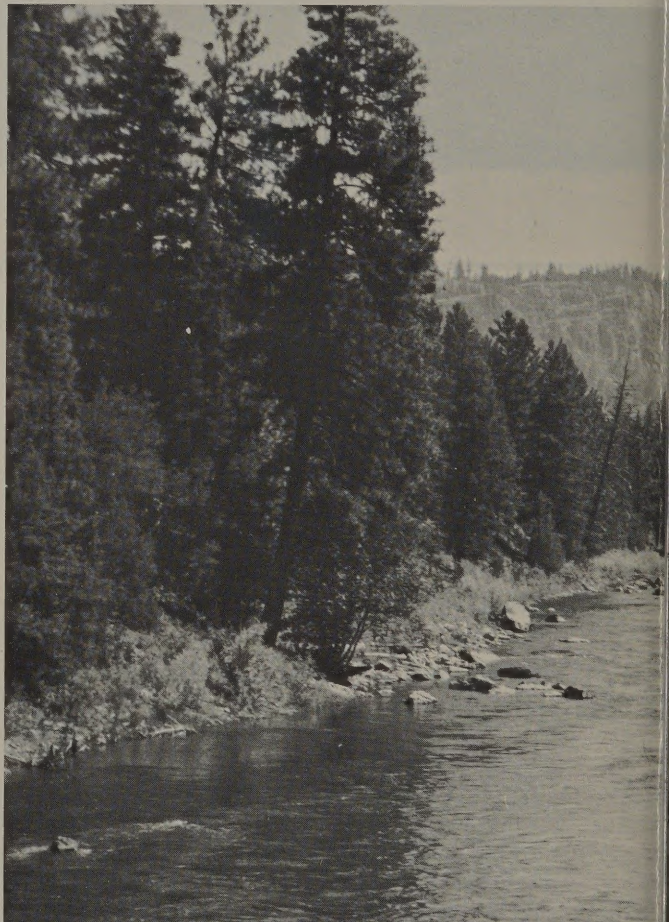
Headwaters of the Missouri show the confluence, from left t right, of the Gallatin, Madison, and Jefferson Rivers.

Montana's abundant water supply is one of the State's greatest resources. Water plays an important role in agriculture, in industry, in power production, in the home, and in recreation.

Montana's intensified irrigation areas are among the State's finest agricultural resources. In addition to high-value crops, irrigated lands are the basis for the important livestock-fattening industry. The largest sources of income in Montana are agriculture and livestock. About 2.4 million acre-feet of water per year are used for irrigation of 1.8 million acres. The importance of irrigation goes far beyond the land itself. The irrigated lands which provide the hay and feed crops for Montana's livestock ranches add immeasurably to the stability of the State's agricultural economy.

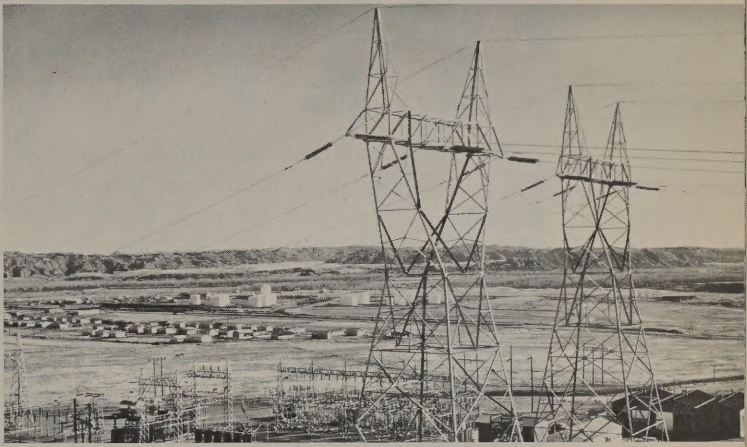
Total use of water by industry, excluding hydropower (a nonconsumptive use), is about 260 million gallons a day. Industrial use of water has increased because of new industries in the State and greater use of water by the petroleum industry. Withdrawal of water for public supplies is about 110 million gallons a day, and rural domestic use amounts to about 42 million gallons per day.

Precipitation in Montana ranges from as little as 8 inches in the south-central plains to 45 inches or more in the Rockies. The average is about 15 inches a year. Runoff is less than half an inch in most of the eastern half and as high as 40 inches or more in the mountains. Average runoff per year is 3.8 inches, less than half the



Water necessary to irrigate this farm land in the Helena Valley comes from the Canyon Ferry Reservoir.

Federal transmission lines carry electric power to homes and industries in Montana and other Missouri Basin states.



Most of Montana's streams and rivers are sparkling clear. The mouth of the Clearwater and Blackfoot Rivers is shown here.

national average, but not unusually low for a Western State. Owing to the large size of Montana, the runoff reaches 27 billion gallons a day, or about 30 million acre-feet per year.

Drainage Basins

The area of Montana east of the Continental Divide is in the Great Plains and drains into the main stem of the Missouri River or its tributary, the Yellowstone. The western part consists of mountains and valleys and is drained by tributaries of the Columbia River, the Kootenai, and the Clark Fork.

Surface water from two major drainage basins in western Montana drains ultimately into the Pacific Ocean. From the Clark Fork and the Kootenai Rivers, an average of 25,100,000 acre-feet flows into the Columbia annually. Of this, 16,979,000 acre-feet originate in Montana and the balance originates in British Columbia portions of the rivers. The major tributary of the Clark Fork is the Flathead River which flows southward from Canada through Montana.

Within Glacier National Park, a small portion of Montana's drainage flows north into Canada and the Hudson Bay Region. Divide Mountain in Glacier Park is the only spot known in the North American Continent which supplies water to the Gulf of Mexico, the Pacific Ocean, and Hudson Bay.

On the Missouri River there are two major multipurpose reservoirs—the 25-mile-long Canyon Ferry Reservoir, with a water surface area of 35,200 acres, and the 189-mile Fort Peck Reservoir, with a surface area of 245,000 acres.

Canyon Ferry Dam, impounding a maximum of 2,051,000 acre-feet was constructed by the Bureau of Reclamation. Fort Peck Dam, constructed by the Corps of Engineers, is designed to provide 19,400,000 acre-feet of storage.

Above Three Forks, three rivers form the Missouri River—the Jefferson, Madison, and Gallatin—and their watersheds, partly within the Yellowstone National Park, provide significant runoff. The Sun, Teton-Marias, Musselshell, Judith, and Milk Rivers are the major streams entering the Missouri River in the prairie section.

The Milk River and its forks, adjacent to Glacier Park, course north and enter Canada. The valley of the Milk River has been developed extensively for irrigation between Havre, Montana, and its mouth, by transbasin diversion of a portion of the water supply from St. Mary River. Streams along the north rim of the State drain into the Milk River, which empties into the Missouri just below Fort Peck Dam.

The Yellowstone River, the most productive tributary of the Missouri system, drains southeast Montana and north-central Wyoming and joins the Missouri River in North Dakota a few miles east of the Montana border.

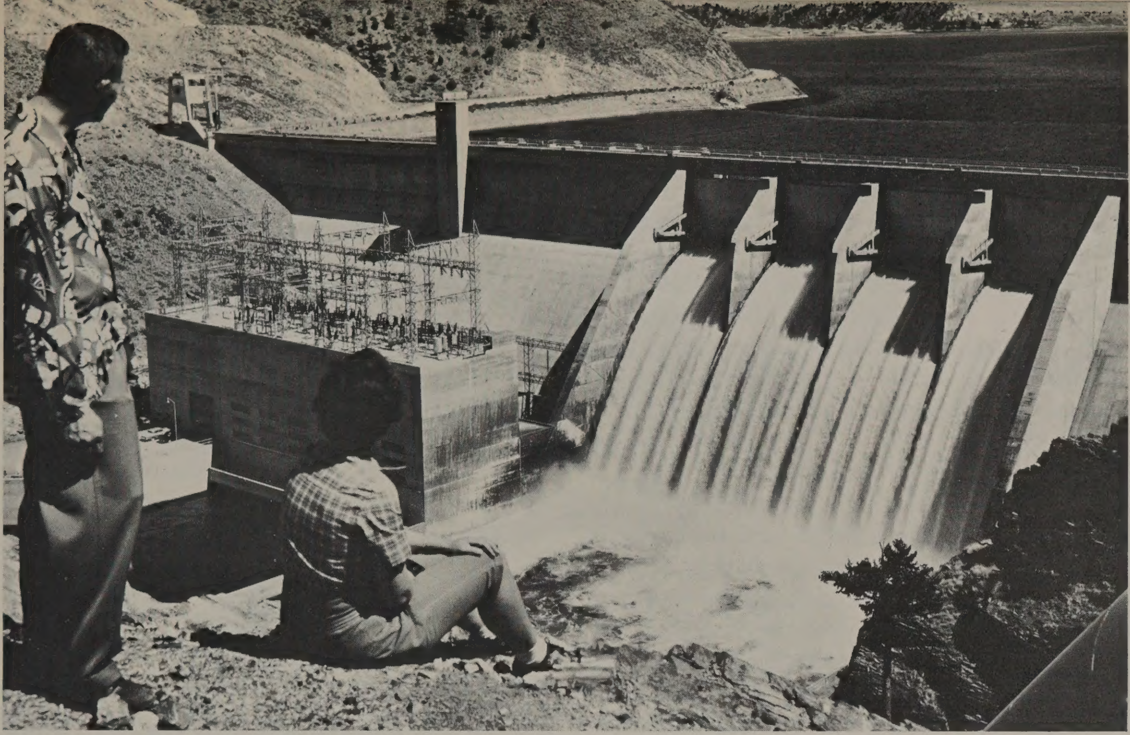
The major tributaries of the Yellowstone River are Clark Fork of the Yellowstone, the Bighorn, Tongue, and Powder. Other principal tributaries within Montana are the Shields, Boulder, and Stillwater Rivers. Unused flows of the Yellowstone and its principal tributaries have been apportioned to Wyoming, Montana, and North Dakota under Yellowstone River Compact, approved by the President in 1951.

Ground Water

Distribution of ground water in Montana is far from uniform. The most widespread sources are beneath the plains, but many of these are too deep to be useful. The most productive aquifers are the unconsolidated valley fill in the west and the alluvium along the larger streams in the east. Bedrock aquifers are important as sources of domestic water, but the alluvial aquifers are those having potential for large-scale production of municipal, industrial, and irrigation water.

In the Upper Missouri River Basin in Montana, hot springs are frequently found in the mountains and along the foothills, and are used in connection with dude ranches and tourist resorts. Near Livingston, one of the State's largest hot springs emanates from a deep-seated formation. Cold springs, also occurring widely, are another source of ground water, particularly in the mountain areas. The Giant Springs, near Great Falls, flow 388,800,000 gallons every 24 hours.

Many wells have been drilled to obtain water



Canyon Ferry Dam, a multipurpose structure near Helena, is an important producer of electricity.

for irrigation, domestic, and municipal use. In all mountain areas, domestic water is easily obtained from surface sources, but in some prairie sections wells must be drilled to depths of from 150 to 300 feet to obtain sufficient potable water.

Development of ground water in the Yellowstone River Basin has been largely limited to wells for domestic and stock water use and for irrigation of small gardens in the dry-land farming areas. The chief source of potable ground water is the alluvial fill found in nearly all the stream valleys and on the bordering terraces. Wells driven below bedrock encounter water-bearing strata at depths of from 100 to 4,500 feet. Deep wells are especially abundant in the central and northeastern portion of the Yellowstone Basin.

Ground water furnishes only about one-fiftieth of Montana's annual total withdrawal. Ground water is, however, very important to rural and public supply. In the future, it will make an even greater contribution to the State's economy, but many more ground-water studies will be needed to aid such development.

Waterlogging

Montana is not the only Western State having large ground water resources not yet put to use. But in some areas, Montana's ground water is a liability rather than an asset, because of waterlogging—when the water table is high enough to drown roots of vegetation. In waterlogged areas, pumping of ground water for public use would relieve the waterlogging and produce water for irrigation of new lands.

Waterlogging resulting from irrigation is an important water problem in Montana. Some of the waterlogged areas are underlain by tight sediments and bedrock. Tiled ditch drainage, pumping from wells, more reservoirs to store flood-waters, and canal lining to curb seepage are possible relief measures for these areas.

Water Rights

Although Montana has ample water supplies and relatively little pollution compared with other States, it is not free of controversies connected with water.

The question of water rights was a ticklish matter for years, but in 1961 the State legislature provided that surface water appropriations made prior to January 1, 1962, should take priority over ground-water rights. After January 1, 1962, concerning use of ground or surface water, first in time is first in right.

The State has a water conservation board which builds irrigation projects and develops municipal water supplies.

Compared to other Western States, Montana is fortunate in her water supply; the State still has untapped water assets. More important, Montana has accepted the responsibility of planning for tomorrow's water demands.

Power Resources

Montana has enormous natural resources for producing electric power, consisting of both water and such fuels as coal, gas, and oil. At present about 90 percent of the State's electric energy comes from hydroelectric power, representing 21 powerplants with a total capacity of 1,261,830 kilowatts. Four of the 21 powerplants, with a total rated capacity of 500,360 kilowatts, are publicly owned. Scheduled for its first power production in 1966 is the Bureau of Reclamation's 250,000-kilowatt Yellowtail powerplant on the Bighorn River in southern Montana. The production of power from steam-electric plants has increased significantly in recent years. In 1958, the Montana-Dakota Utilities Co. completed a 50,000-kilowatt plant near Sidney, which burns lignite. The company also has two small steam-electric plants, with a total capacity of 9,600 kilowatts, in eastern Montana. The Montana Power Co. operates a 60-000-kilowatt steam-electric plant in Billings. It burns either oil or natural gas.

Columbia River Drainage

Ten of the hydroelectric powerplants in Montana are in the Columbia River drainage. Of these, four are owned by the Montana Power Co., two by Montana Light & Power Co., one by the Pacific Power & Light Co., and one by the Washington Water Power Co. These eight privately owned plants have a total installed capacity of 493,670 kilowatts.

There are two publicly owned hydroelectric powerplants in the Columbia River drainage—the Bureau of Reclamation's Hungry Horse Dam and the Bureau of Indian Affairs Big Creek powerplant.

The Hungry Horse Project is an outstanding example of an upstream multiple-purpose storage reservoir whose regulation increases power production at plants downstream in the Columbia River drainage. Based on recent installed capacities of the downstream hydropower plants, the Hungry Horse Project, with a rated capacity of 285,000 kilowatts, increased the system prime power in the Columbia River System by over 1 million kilowatts. The Hungry Horse Project also contributes significantly to flood control and navigation benefits downstream. Future irrigation development likewise can benefit from this source of available low-cost power.

Missouri River Drainage

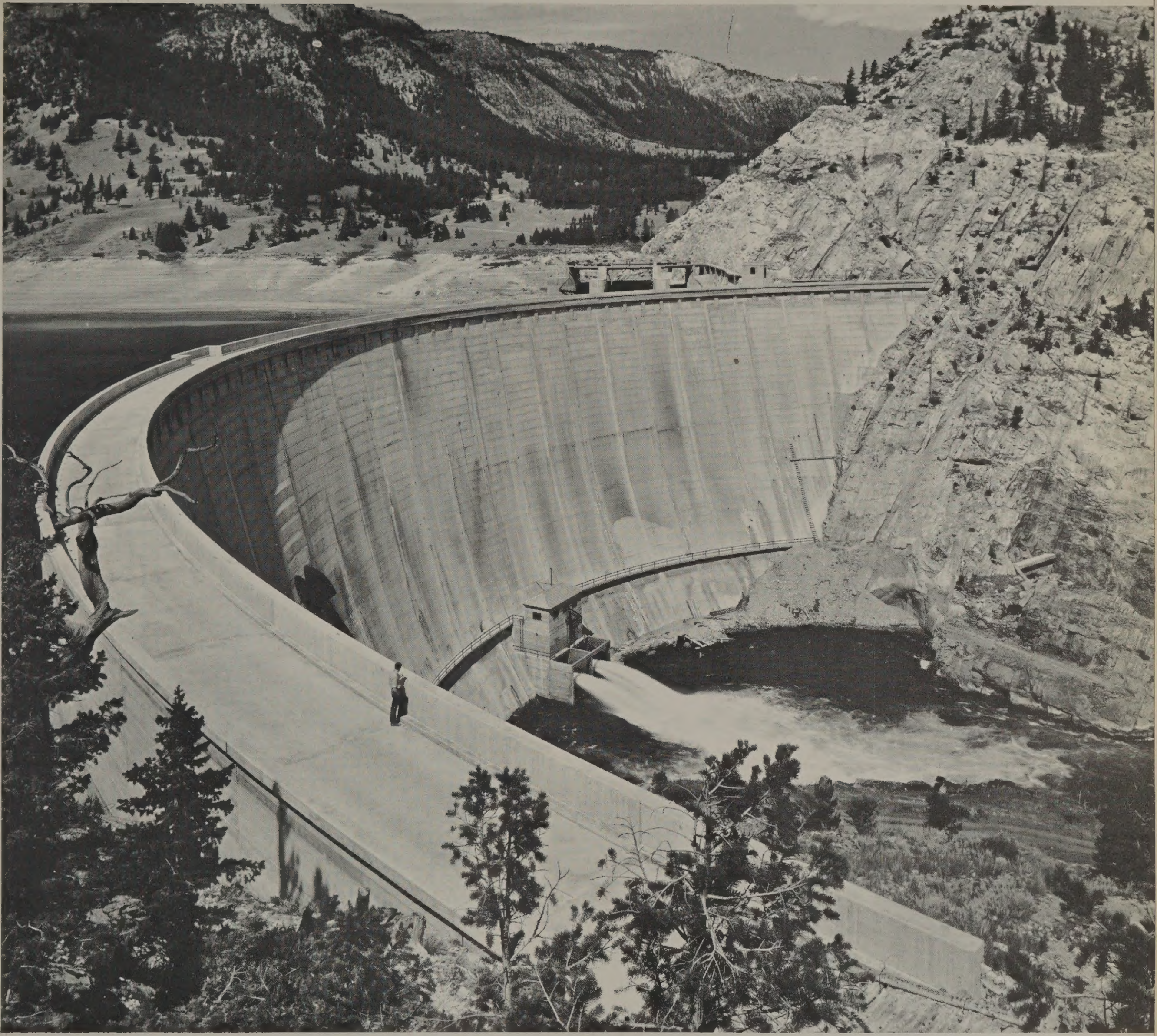
Of the 11 hydroelectric plants in Montana east of the Continental Divide, 9 are on the main stem of the Missouri River, and have a total capacity of 463,800 kilowatts. This total includes the 165,000-kilowatt Fort Peck powerplant built by the Army Corps of Engineers and the 50,000-kilowatt Canyon Ferry powerplant constructed by the Bureau of Reclamation.

The multipurpose Canyon Ferry Unit, consisting of a dam, reservoir, and powerplant, is a part of the Missouri River Basin Project, a resource development program authorized in the Flood Control Act of 1944, and subsequent legislation, for the conservation, control, and use of the water resources of the entire Missouri River Basin.

The Fort Peck powerplant and the Canyon Ferry powerplant are a part of the eastern division of the Federal Missouri River Basin Project Power Systems, which also includes four operating Corps of Engineers downstream main-stem plants—one in North Dakota, two in South Dakota, and one on the South Dakota-Nebraska State line. The six federally owned hydroplants on the main-stem of Missouri River have a total capacity of 1,630,000 kilowatts. Another Corps of Engineers downstream main-stem plant in South Dakota is scheduled to join the Missouri River Basin Project Power System. Its capacity is expected to be 468,000 kilowatts.

The Bureau of Reclamation markets and distributes electricity generated at hydroelectric plants built by the Bureau of Reclamation and the Corps of Engineers in the Missouri River Basin.

A comprehensive study of the water resources



Gibson Dam, on the Sun River, forms an irrigation reservoir with a capacity of more than 100,000 acre-feet.

of the 200-mile section of the Missouri River between the privately owned hydroelectric plants near Great Falls and the upstream end of Fort Peck Reservoir has been completed. Eleven plans for development were studied jointly by Department of the Interior agencies and the Corps of Engineers. Power, flood control, recreation, fish and wildlife, and land management were considered. The maximum powerplant installed capacity shown was 1,100,000 kilowatts.

The Bureau of Reclamation also has studied the Lyon Unit in the Madison River Basin for an 18,000-kilowatt power installation, and studies of the power potential of the Yellowstone River Basin are underway. Interrelationships of hydroelectric and thermal-electric power developments also are being surveyed.

Mineral Resources

Montana owes its statehood to minerals. Gold and silver strikes in what is now Montana attracted the miners and prospectors who were the area's principal inhabitants when it became a Territory in 1864. Many early settlers were prospectors who had failed to prosper in the gold camps of Colorado, Nevada, and California. The rich mineral resources beneath mountain and plain have led Montana to call itself the "Treasure State."

The first great attraction was gold in southwestern Montana, found both in lode and placer deposits. As the gold fever spread, the country was flooded with miners and prospectors who established the mining camps now legend—Virginia City, Bannack, Confederate Gulch.

From southwestern Montana the gold search spread outward and major strikes were soon made as far north as Helena. At the present site of Butte, veins rich in silver but poor in

gold and copper were found. As the mines penetrated deeper in search of richer ore, the copper content increased and before long copper became—and has remained to this day—the dominant metal mined in the Butte-Anaconda area. The bitter battles of the "Copper Kings" were for control of these deposits; the great labor battle that racked Montana between 1912 and 1914 also centered about these deposits.

(Above) Phosphate mine in Beaverhead County. (Below) Berkeley Pit, third largest copper mining operation in the United States. Butte is in the background.

Rich lodes and placer deposits in the Treasure State have yielded more than $4 billion in metals since 1862. Today Montana's mineral production—averaging from $180 to $190 million a year—ranks 24th among the States, and Montana's mineral industries provide most of its nonagricultural employment. Vast untapped resources of minerals and mineral fuels are available for steady development of the industry.

Mineral Economy

Minerals and mineral-processing industries no longer dominate Montana's economy, but next to agriculture they are responsible for the greatest amount of commercial activity and employment in the State. Petroleum production has represented, on the average, about two-fifths of the value of all Montana's mineral output for several years. Copper has been the most important metal in the State's history.

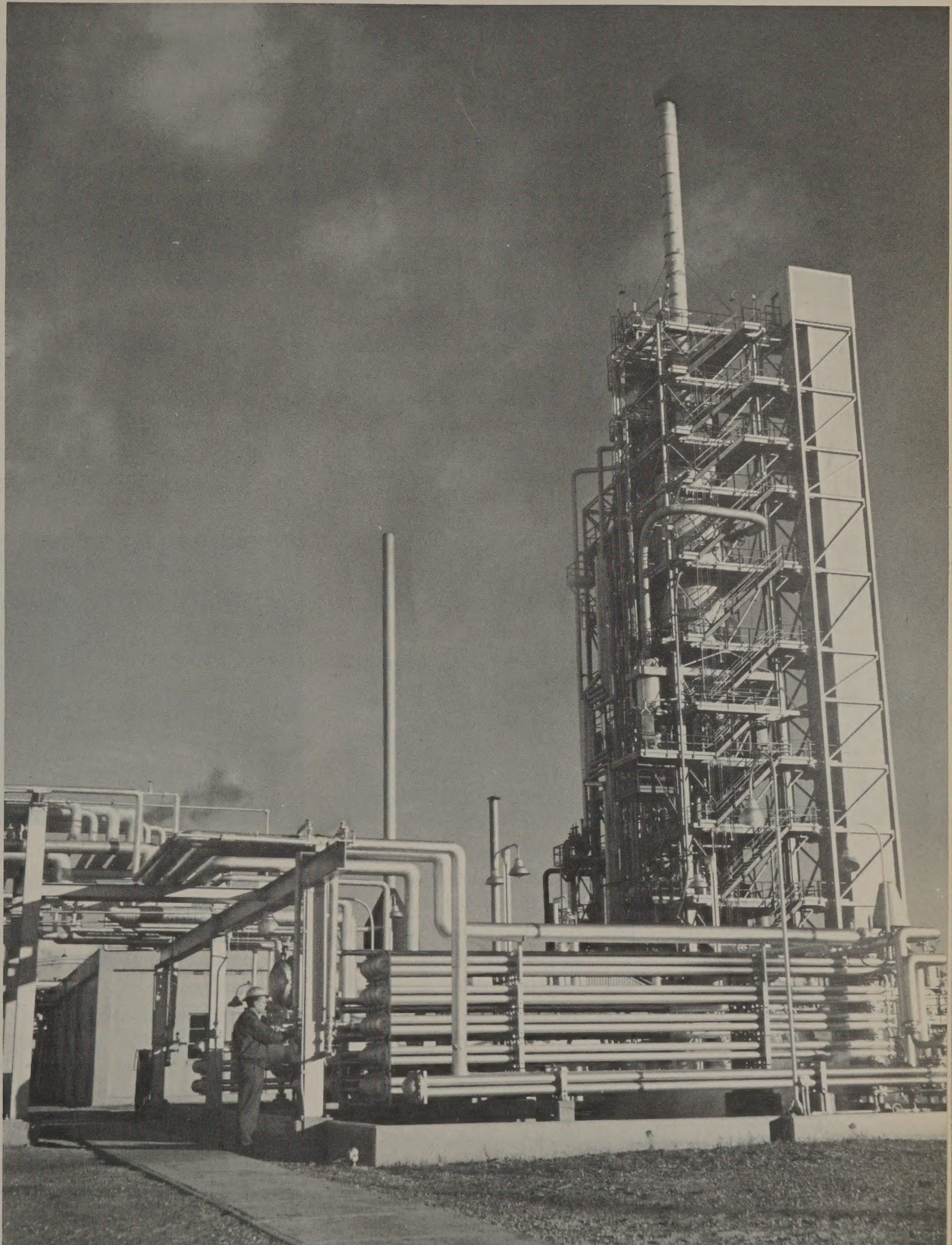
Copper represents well over half the total $4 billion value of all metals produced in Montana since 1862. In recent years its value has averaged between 60 and 90 percent of the State's output of metals. The State's production of sand and gravel, of other nonmetallic minerals used in construction and in agriculture, and of mineral fuels is trending upward, while that of base metals and gold is trending downward. However, output of individual commodities fluctuates greatly from year to year.

Each of Montana's 56 counties has valuable mineral resources and all but one or two regularly report annual mineral production worth $25,000 or more. Petroleum and other mineral fuels are found under the high plateaus and prairies from the Rockies east to the Dakotas. The lode and placer metals—copper, silver, zinc, gold, and lead—have always been mined in the valleys and stream beds of the high Rockies and westward to the Bitterroot Mountains on the Idaho border.

The Summit Valley district is the heart of the southwestern lode country, producing virtually all Montana's copper and most of its other lode metals, as well as manganese, phosphate rock, and sand and gravel. Average production for the district, valued at between $60 million and $70 million annually, is the highest in the State.

Oil-rich Fallon County, in the southeast near the Dakota border, ranks second in the State

(Below right) Montana's refineries process over 24 million barrels of crude petroleum and natural gas liquids annually.

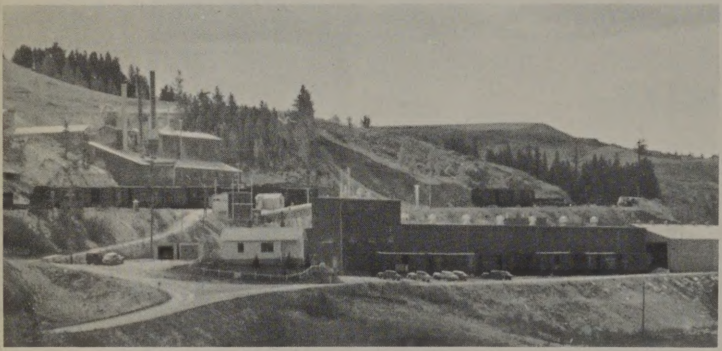


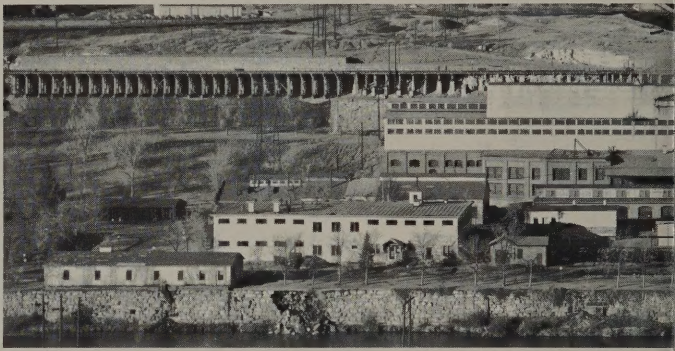
(Left) Montana ranks high in fluorspar production. This fluorite mine is in Ravalli County.

in mineral production value. Wholly within its borders are eight oilfields and three natural-gas fields, with total average annual output of about $16 million. Fallon also overlies a portion of the State's most productive oilfield, Pine, which it shares with neighboring counties.

Petroleum and Natural Gas

A vigorous and successful search for oil has been carried on in Montana since 1919, and oil now captures the imaginations of Montanans as gold once did. Geophysical crews and drilling rigs are common throughout central and eastern Montana. As a result, Montana ranks among the top 15 States in the Nation in production of oil and in proved reserves. Three oilfields—The Pine and Cabin Creek in eastern Montana, and the Elk Basin in the south-central part—produce about 40 percent of the State's total output. The Cutbank field in north-central Montana and the Stensvad and Sumatra fields in central Montana each produce more than a million barrels of oil annually. The Elk Basin field, which extends into Wyoming, produces in excess of 3 million barrels annually.





(Above) Gypsum is processed for use in construction. Copper is smelted at the plant shown at right.

Exploratory drilling for mineral fuels, particularly petroleum and natural gas, is continuing in Montana, and the full extent of the State's mineral fuel reserves is yet to be determined.

Two dozen counties produce oil or natural gas or both. More than 30 million barrels of petroleum, valued at nearly $75 million, and more than 33 billion cubic feet of natural gas valued at $2.5 million have been produced in typical recent years. Cut Bank field, in Toole and Glacier Counties, is the largest natural-gas field, producing about a third of the State's total supply.

Ten Montana refineries process more than 24 million barrels of crude petroleum and natural-gas liquids annually. Most of the crude oil is piped in from wells in Wyoming. About 2,900 men are employed in oil and gas production, processing, and pipeline transportation.

Bituminous Coal and Lignite

Coal is found in much of the State, but the great reserves, in the western part of the Great Plains, have hardly been tapped. Early in the century coal mining was a major industry filling energy and heating needs of the mines, smelters, railways, and homes. Coal mines were worked throughout the State; the largest mines were near Great Falls at Sandcoulee, near Livingston, and near Red Lodge. As the rail lines turned to diesel power and the householder to natural gas or fuel oil, the coal industry slackened and many mines closed. But billions of tons of coal await the demands of the future.

Bituminous coal reserves in the State total more than 2 billion tons, and Montana leads the Nation in the volume of its subbituminous coal reserve, with 130 billion tons virtually untapped. Its lignite reserve of more than 87 billion tons is second only to that of North Dakota. Neither of these fuels can compete at present against higher rank fuels except where transportation expenses are eliminated and power stations or other consuming industries are located close by the mines. However, the sheer magnitude of these reserves, coupled with the State's tremendous resources of lean ores of various metals, provide a solid base for Montana's metallurgical industry.

Output of solid fuels mined in Montana is rising. There are several underground mines and strip mines in nine counties; seven mines in Musselshell County supply 80 percent of the State's bituminous coal output. Lignite comes chiefly from mines in Richland County. The steam-electric generating plant at Sidney, Richland County, is the leading consumer of lignite.

Copper and Associated Lode Metals

Combined underground and surface mines in Silver Bow County near Butte produce nearly all the copper and most of the gold and silver now mined in Montana. All this ore is shipped to concentrating and smelting operations at Anaconda in neighboring Deer Lodge County. A new beneficiating plant at Butte will reduce shipping costs and permit even larger output as market conditions permit. Montana is the third largest copper-producing State, exceeded only by Arizona and Utah.

Lode ores usually contain varying proportions of copper, gold, silver, zinc and lead. Mines in the lode country operate or close down depending on the demand for their principal metals, the cost of the mining and concentrating process used, and the availability and cost of transportation. After Silver Bow County, Madison County is highest in gold production and Granite County is highest in silver production. Lewis and Clark County produces the largest amount of lead and zinc in the State.

Other Metals

Aluminum is produced and fabricated in a plant at Columbia Falls, operated since 1955. Chromium is mined and concentrated from time to time. Iron ore is mined in Broadwater and Judith Basin Counties. Ferromanganese for steel plants and iron-free manganese for use in dry-cell batteries are mined and concentrated by some companies in the State. Ferromanganese production is increasing and may rise much higher if a proposed steel plant is built at Anaconda. Tungsten is mined from an open-pit operation near Wise River, in Beaverhead County. A small underground uranium mine is operated in Carbon County.

Montana ranks high among the leading States in the production of tungsten, fluorspar, chromite, arsenic, vermiculite, phosphate, and silver. It is almost the only domestic source of the grade of manganese used in dry-cell batteries.

Construction Materials; Other Nonmetallics

Among other materials that are mined profitably in Montana are limestone (for cement), clay, shale (for lightweight aggregate), gypsum (for wallboard and lath), and sand and gravel.

Sand and gravel valued at more than $13 million annually is produced in 35 counties and is available as needed in most of the others. Stone production is reported from 18 counties. The State's only cement plant, in Gallatin County, is increasing its activity as demand rises in Montana and in nearby States, which consume a quarter of Montana's output. Lime is produced from limestone mined in five counties, and phosphate rock for making fertilizer and elemental phosphorus is produced in three counties. Talc is mined in Beaverhead and Madison Counties and exported widely. Clays of various kinds are mined in several counties. Montana also produces some barite, fluorspar, gypsum, mica, and vermiculite. High-purity elemental sulfur is obtained as a byproduct at two oil refineries near Billings.

The Land Resources

(Above) The State's many acres of prairie are well suited to grain production. (Below left) Strip farming produces a variegated pattern in eastern Montana. (Below right) Montana is 3d in wheat production.

Of Montana's total area—147,138 square miles—approximately 30 percent is owned by the Federal Government. There are two types of federally owned lands in Montana: public lands and acquired lands. Public lands are the remainder of the original public domain which has always been in Federal ownership. Acquired lands are obtained by the Federal Government mainly through purchase or exchange.

The responsibility for administering Federal lands in Montana falls mainly on seven Federal agencies of three different departments: the Bureau of Land Management, National Park Service, Bureau of Reclamation, Fish and Wildlife Service, and the Bureau of Indian Affairs in the Department of the Interior; the Forest

Roundups collect as many on-lookers as horses.

Service of the Department of Agriculture; and the U.S. Army Corps of Engineers in the Department of the Army.

Federal lands in Montana lend themselves to a wide variety of uses, including grazing, recreation, mineral, and timber production, wildlife habitat, and parks and forests.

Agricultural Resources

During the past 30 years, Montana's farms have steadily increased in size, but the total farm population has shrunk just as steadily. Only 15.6 percent of the total population in Montana is engaged in farming.

The tourist industry, petroleum industry, mining, manufacturing, and lumbering are secondary to agriculture as income producers. In recent years, Montana's agricultural products returned annual cash receipts averaging about $435 million. Over 50 percent of this total was contributed by livestock and livestock products. Other important agricultural products are wheat, barley, sugarbeets, and hay. The State's wheat production is over 84 million bushels yearly, ranking Montana third among the Nation's wheat-producing States. Montana usually ranks 16th among the States in hay production; 3d in barley; 5th in sugarbeets; 5th in number of sheep and lambs; 4th in wool production; and 11th in number of cattle and calves produced.

Timber Resources

About 24 percent of the State's land area is forest. More than 16 million acres are included in Montana's 11 national forests. While much of the commercial forest land is within the national forests, important segments of this

Sugarbeets, loaded on the truck below, are one of Montana's principal crops. Timber also contributes to the State's economy and hay is a vital support for the livestock industry.

resource are managed by the Bureau of Land Management, Bureau of Indian Affairs, the State of Montana, and private interests.

Of the total forest area in Montana, 15,727,000 acres are classified as commercial forest land. Almost 480 million board feet of timber are cut annually on these lands. Most of the timber is used in sawlogs. Other uses are pulpwood, railroad ties, fuel woods, posts, and poles.

Nearly all the lumber produced is softwood. Most important species are: ponderosa pine, Douglas-fir, Engelmann spruce, western larch. Other softwoods include western white pine, lodgepole pine, and true firs.

Although the fighting of fires still requires considerable effort and expense, fire losses have been greatly reduced. During the past few years, damage of major proportions to Montana's forest has been caused by such pests as dwarf mistletoe, bark beetle, and spruce budworm. The spruce budworm alone has been responsible for killing over a billion board feet of timber in Montana.

Range Resources

Of the 60 million acres of natural rangeland in Montana, 46 million are used principally for grazing. Of the total rangeland, about three-fourths are privately owned, but substantial acreage still remains as public rangeland, most of which is administered by the Bureau of Land Management. More than 5 million acres of these public ranges are in districts established under the Taylor Grazing Act of 1934.

Reflecting the importance of livestock is the fact that 49 of Montana's 56 counties have over 60 percent of their farmlands in pasture. Total value of all livestock in the State is approximately $200 million, including about 2,300,000 cattle, 1,500,000 sheep, and 112,000 hogs.

Montana's grazing areas also support approximately 250,000 deer, 60,000 antelope, 45,000 elk, and 4,500 moose.

The Indians and Their Resources

Most of the Indian tribes of Montana settled there about 200 years before the Lewis and Clark expedition of 1805–6 opened the region to settlement by the white man. Divided by the main range of the Rockies, the Indians represented two cultural groups—the Eastern Plains Indians, and those of the Western Plateau.

The Plains Indians were hunters of the buffalo, which provided them with food, shelter, tools, and certain items of clothing. The Western Plateau Indians were trappers and fishers until the horse gave them access to the buffalo ranges which had been solely the domain of their neighbors to the east. Thereafter, bitter intertribal wars were fought over the choicest buffalo ranges, and tribal enmities were formed which lasted for many years and had a pronounced effect on later relationships between the Indian tribes and the Federal Government.

Eastern Tribes

Predominant among the Eastern Plains tribes were the Blackfoot and the Crow. The Blackfoot Confederacy was of Algonquian stock and, until about 1730, lived in the present Province of Saskatchewan. They drifted southwest where buffalo and other game were more abundant, engaged in considerable warfare over buffalo ranges and acquisition of more and better horses. Family wealth was measured by the number of horses possessed—a tradition which still persists.

The Crow, of Siouan origin, broke away from their ancestral group and settled along the valleys of the Yellowstone and Bighorn in northern Wyoming and northeastern Montana. They had been an agricultural people, but with the change to the buffalo economy, a culture evolved where the highest recognition was obtained by military valor. The Crows competed through warfare for the hunting territory which they still occupied when the U.S. Army was attempting to settle Indians on reservations. They then joined the Army in fighting Indian tribes with which they were already at war.

Among the other Eastern Plains tribes in Montana were scattered bands of Sioux, northern Cheyenne, the Gros Ventre or Big Bellies, and the Assiniboine.

The northern Cheyenne were extremely hostile to the whites, and those in Montana willingly joined the Sioux in the wars of 1876, during which General Custer and his troops were annihilated. Later subdued, the northern Cheyenne were taken as prisoners of war to be

Annual pow-wow of the confederated Kootenai-Salish tribes attracts dancers from the more than 30,000 members of Montana's Indian tribes.

colonized with the southern Cheyenne at Fort Reno, Okla. Following a desperate attempt to escape, nearly half of the group was killed. Sixty of the survivors fled to the north and in 1884 were placed on their present Montana reservation.

The Gros Ventre tribes, particularly the Atsina, were of Algonquian stock, closely related to the Arapahoe, and lived in the present area of Montana when first encountered.

Plateau Indians

The Western Plateau tribes included the Salish (Flathead) and the Kootenai. The Salish moved into the Bitterroot Valley before 1800, forced westward by the marauding Shoshoni and Blackfoot. The traditional home of the Kootenai was on the eastern slopes of the Rocky Mountains in present Montana and Alberta, Canada. They were pushed westward by the Blackfoot, and were almost constantly at war with that tribe until their wars ended in 1810.

Around 1880, two other groups of Indians began to drift into the Montana region: small bands of Chippewa from Minnesota, and some Cree from Canada. The Shoshoni of Wyoming, Blackfeet, Crow, and Flathead contested control of southwestern Montana on the Yellowstone as late as 1885, until all were settled on reservations.

Two early treaties were of particular importance to the Indians of Montana. The Fort Laramie Treaty of 1851 set aside a vast area for the Blackfoot tribes; established the Crow reservation; gave recognition to the north and south tribal separation of the Cheyenne; and provided for rations to be furnished to the Assiniboine at a station near the present town of Harlem. In 1855 the Government made a treaty with the Blackfeet and several of their neighboring tribes which provided for use of a large portion of the original reservation extending eastward to the Dakotas as common hunting territory. The Blackfoot Hunting Territory, however, did not fulfill its intended purpose of keeping peace among the tribes.

By the Legislative Act of 1888, the area was broken up to form three separate reservations.

Indians Today

Today there are seven reservations in Montana: the Blackfoot in Glacier and Pondera Counties; the Crow in Bighorn and Yellowstone Counties; the Flathead in Lake, Sanders, Missoula, and Flathead Counties; Fort Belknap of the Gros Ventre and Assiniboine located in Blaine and Phillips Counties; Fort Peck, occupied by Assiniboine and Sioux in Roosevelt, Valley, Sheridan, and Daniels Counties; and Rocky Boys in Hill and Choteau Counties. The Rocky Boys Reservation was established in 1916 to provide a land base for the homeless Chippewa and Cree Indians, who had moved back and forth across the International Boundary Line and because of their unsettled situation were in dire circumstances. The Rocky Boys Reservation is named after a chief of the Chippewas.

Nearly 31,000 Indians are enrolled as members of several Montana tribes. However, only about 18,000 reside on reservations. Most of the remainder are in non-Indian communities of Montana; some reside in other States.

Some Montana Indians—notably the Fort Peck tribes—have achieved, through farming or businesses on the reservation, or by work away from it, an economic and social situation comparable to that of non-Indians in the area. The

Fort Peck Indians also have benefited by development of oil resources on their reservation.

Indian Lands

Indian lands in Montana comprise 5¼ million acres, or approximately 5½ percent of the total area of the State. About 30 percent of the Indian land is tribally owned and the remainder is owned by individual Indians or their heirs. In addition to these Indian trust lands there are about 130,000 acres of federally owned lands used for the benefit of Indians.

Of the seven Indian reservations in Montana, the largest is the Crow, with over 1½ million acres of trust land. The smallest is Rocky Boys Reservation with 100,000 acres. There are also 78,537 acres of Turtle Mountain Public Domain allotments in Montana.

Nearly a million acres of Indian land in Montana are leased for agriculture.

Oil and gas development represents virtually all the mineral activity on Montana Indian lands. About 2,000 oil and gas leases are in effect, the majority on Fort Peck lands. Income from oil and gas leases, which includes bonuses from sales, ground rental, and royalties amounts to about $4 million during a typical year.

There are about 55 permits or leases for minerals other than gas and oil on Indian lands in the State. Nearly all are sand and gravel permits. Total annual income from these permits and leases is about $19,000.

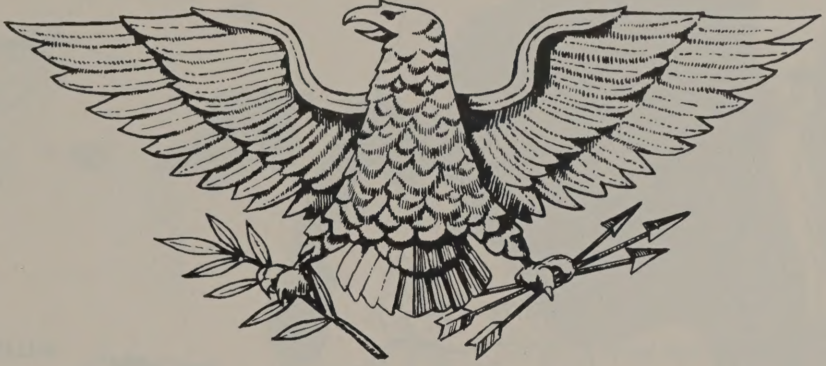
Indian reservations in Montana include almost a million acres of forest land. Because of adverse soil and climate conditions prevailing on many of the reservations, only about half this forest area supports a commercial timber crop. The half million acres of commercial timberlands contain about 2.75 billion board feet of timber.

The Flathead Reservation contains over 2 billion feet of commercial timber—73 percent of the total volume of the Indian timber in Montana. Other reservations with commercial forest lands are the Blackfoot, Crow, Rocky Boys, Northern Cheyenne, and Fort Belknap.

On the Montana reservations there are nearly 3 million acres of rangeland in established grazing units. Indians are using 43 percent of this range resource. Annual receipts collected and paid to landowners for use of the range total nearly $1 million. Most of the livestock grazed on Indian lands are cattle, although more than 100,000 sheep use the ranges some months of the year. Range management personnel of the Bureau of Indian Affairs work closely with the people using the range to develop and implement plans to increase returns through proper land-use practices.

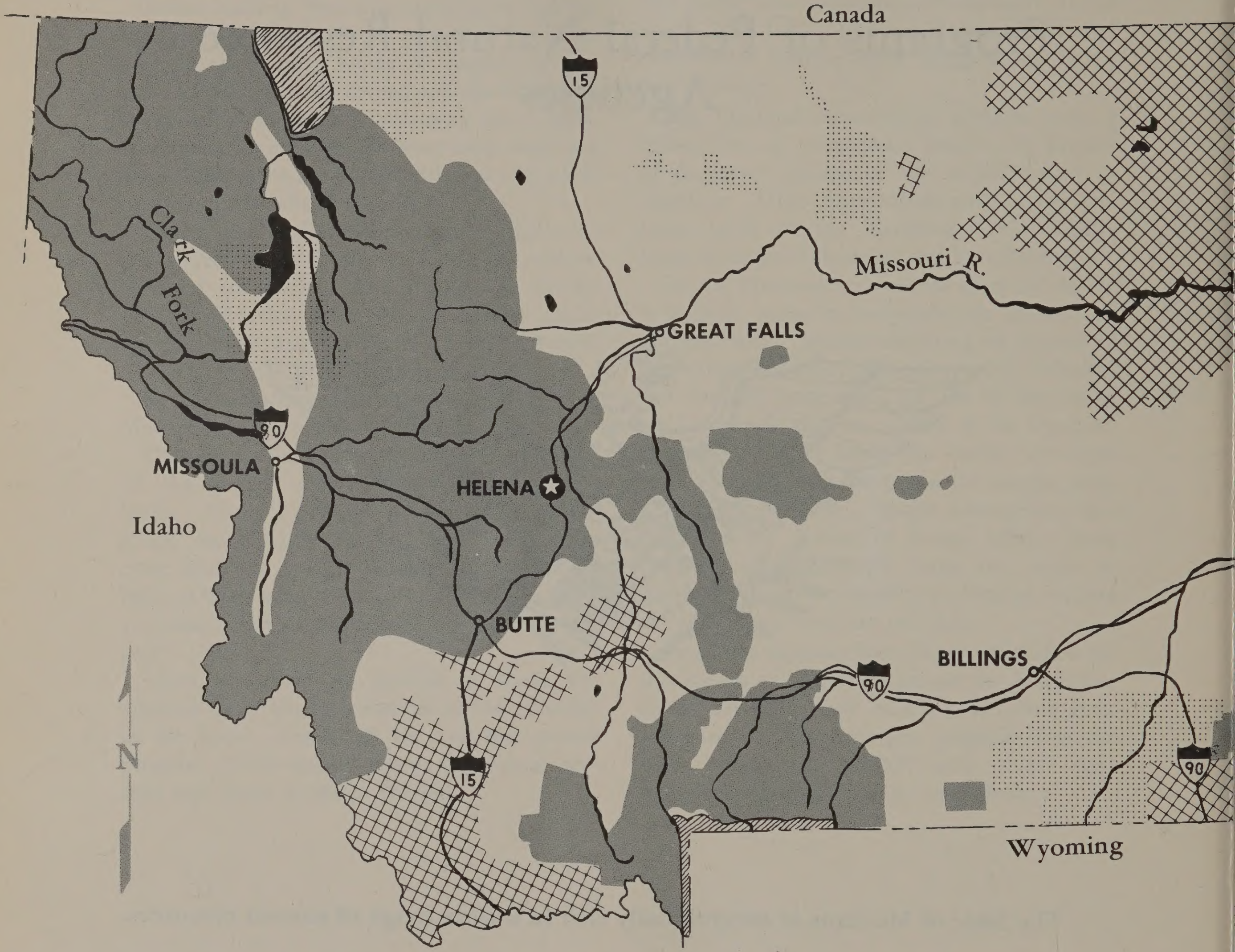
Irrigation projects have been established by the Bureau of Indian Affairs on the Blackfoot, Crow, Flathead, Fort Belknap, and Fort Peck reservations. The ultimate irrigable area for these projects is 311,000 acres. New construction and rehabilitation are underway.

Programs of Federal Natural Resource Agencies



The State of Montana is exceptionally rich in a wide range of natural resources. The wise use and protection of such endowments long have been the concern of natural resource agencies of the Federal Government. The following pages describe some of these programs and interests. Full information can be obtained by contacting the offices listed on p. 46 and elsewhere in this publication.

Facilities of Federal Natural



Forest Service, Department of Agriculture

Regional Headquarters, Missoula
Ranger District Offices:
  Dillon, Ennis, Jackson, Lima, Sheridan, Wisdom, Wise River, Darby, Hamilton, Stevensville, Sula, Ashland, Red Lodge, Camp Crook, Nye, Boulder, Butte, Deer Lodge, Philipsburg, Whitehall, Kalispell, Condon, Hungry Horse, Columbia Falls, Bigfork, Whitefish, Big Timber, Bozeman, Gallatin, Gardiner, West Yellowstone, Livingston, Helena, Lincoln, Townsend, Libby, Fortine, Rexford, Troy, Warland, Great Falls, Neihart, Stanford, Lewistown, Harlowton, Augusta, Choteau, White Sulphur Springs, Clinton, Lolo, Missoula, Huson, Plains, St. Regis, Superior, Thompson Falls, Seeley Lake.
Research Centers, Bozeman, Missoula
Forest Fire Laboratory, Missoula
Equipment Development Center, Missoula

Bonneville Power Administration

District Office, Kalispell

Geological Survey

Water Resources Division Offices:
  Billings, Helena, Kalispell
Conservation Division Offices:
  Billings, Great Falls

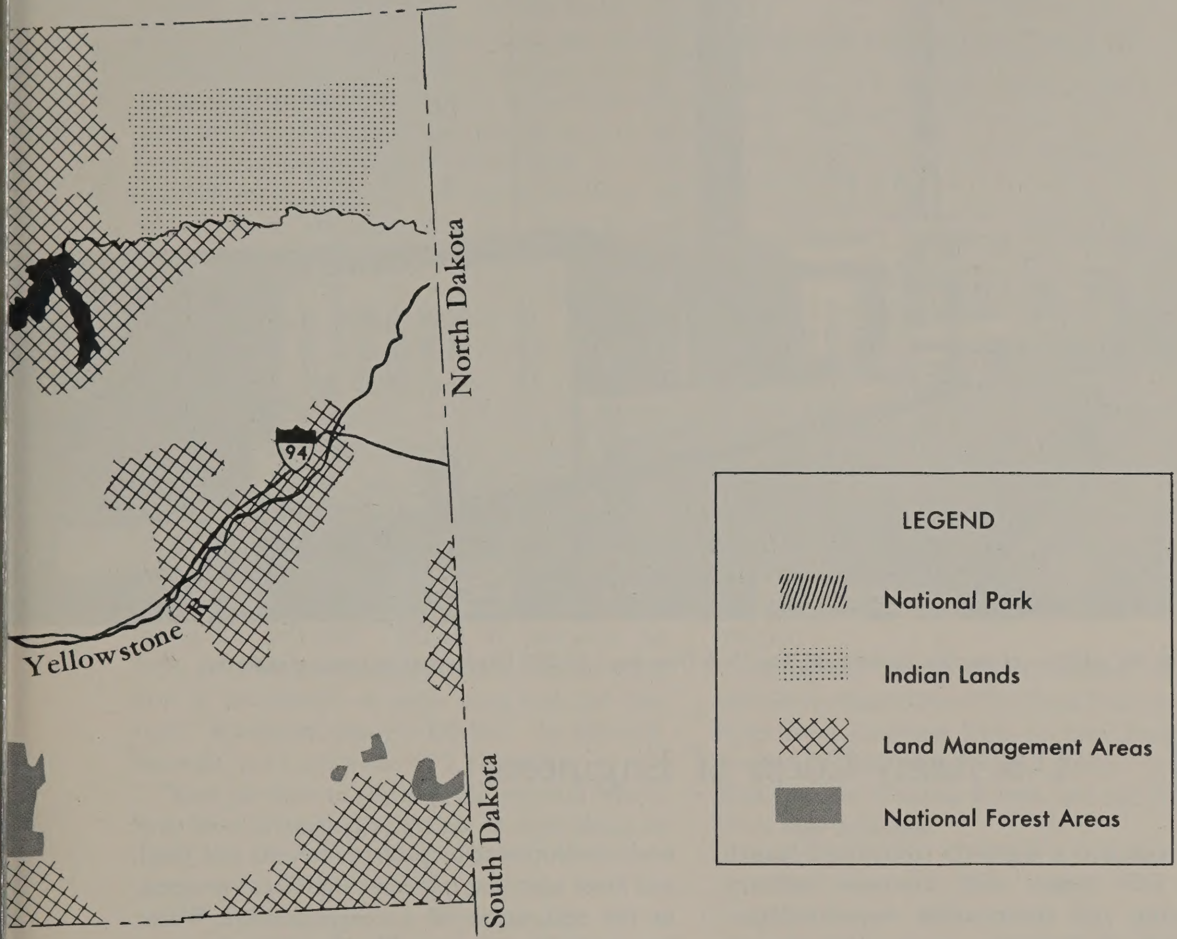
Bureau of Indian Affairs

Area Office, Billings
Blackfeet Agency, Browning
Crow Agency, Crow Agency
Flathead Agency, Dixon
Fort Belknap Consolidated Agency, Harlem
Fort Peck Agency, Poplar
Northern Cheyenne Agency, Lame Deer
Missouri River Basin Investigations Project, Billings

Bureau of Sport Fisheries and Wildlife

Management and Enforcement District Office, Helena
Predator and Rodent Control District Office, Billings
River Basin Studies Area Office, Kalispell

Resource Agencies



Fishery Management Field Office, Kalispell
Cooperative Wildlife Research Unit, Missoula

National Fish Hatcheries:
- **Bozeman**
- **Creston at Kalispell**
- **Ennis**
- **Miles City**

National Wildlife Refuges:
- **Benton Lake at Great Falls**
- **Bowdoin at Malta**
- **Charles M. Russel National Wildlife Range, Lewistown**
- **Medicine Lake**
- **National Bison Range, Moiese**
- **Red Rock Lakes, Monida**

Bureau of Land Management

State Office, Billings
Land Office, Billings
Records Improvement Office, Billings
District Offices: Malta, Miles City, Billings, Dillon, Lewistown, Missoula

Bureau of Mines

Health and Safety Office, Billings

National Park Service

Big Hole Battlefield National Monument, Yellowstone Park, Wyo.
Custer Battlefield National Monument, Crow Agency
Glacier National Park, West Glacier
Yellowstone National Park (Wyoming-Montana-Idaho), Yellowstone Park, Wyo.

Bureau of Reclamation

Regional Office, Billings
Project Offices: Hungry Horse, Miles City, Fort Peck, Dillon, Hardin
Canyon Ferry Project Office, Helena
Upper-Missouri Projects Offices: Great Falls, Malta

Resource Programs Staff

Missouri Basin Field Committee, Billings

With the addition of another powerhouse, Fort Peck Dam has 165,000 kilowatts of generating capacity.

U.S. Army Corps of Engineers

Although it is a regularly constituted branch of the U.S. Army, with extensive military engineering and construction responsibilities, the Corps of Engineers is engaged also in planning and building projects in Montana and other States for power development, flood control, navigation, and water conservation as primary civil functions under Federal law.

Several projects to fulfill the multiple-purpose role of water resource development are included in the program of the Corps of Engineers in Montana. Fort Peck Dam on the Missouri River near the eastern boundary provides downstream flood protection, supplies irrigation water, stores water for flow regulation, generates power, and is a popular public recreation area.

Local protection projects have been completed at Glasgow, Forsyth, Havre, Saco, Clydepart, and West Glendive. These projects, together with development by private interests and local and State agencies, represent significant progress in the realization of a comprehensive Water Resources Development Plan for Montana.

Missouri River Basin

The Missouri Basin Project is designed for four basic purposes: flood control, irrigation, production of hydroelectric power, and improvement of navigation on the lower Missouri. Other allied benefits to the people of the valley and to the Nation are improved municipal water supply, conservation of fish and wildlife, and public recreational advantages.

The program provides reservoir storage capacity of approximately 110 million acre-feet for multiple-purpose public use. This includes water for irrigation of some 4 million acres of land. It permits the ultimate production of some 13 billion kilowatt-hours of hydroelectric power annually for farm electrification, industrial and municipal expansion, pumping of irrigation water, and other domestic uses.

The program provided originally for the building of some 103 dams and reservoirs, as well as the construction of levees and floodwalls to protect municipal, industrial, and agricultural areas, agricultural levees on both side of the Missouri between Sioux City and the mouth to protect bottomlands, and completion of the channel stabilization project from Sioux City to the mouth. To these ends, and others as the need arises, the Corps of Engineers cooperates with various States, and with the Departments of Interior and Agriculture as well as other Federal agencies to determine the best solution for water resource needs.

An outstanding feature of the program is the control of the upper Missouri, effected principally by a system of six Corps of Engineer reservoirs on the main stem to regulate runoff. Fort Peck Reservoir, described earlier, is one of the major units in this six-reservoir system which has a combined capacity of more than 76 million acre-feet. Placed in operation in 1938, Fort Peck is the largest hydraulic earthfill dam in the world—4 miles long and 250 feet high. Maximum depth is 220 feet. Its 189-mile reservoir has a shoreline of 1,520 miles.

Those portions of the over all program which have been completed or are far enough along to be partially operative have prevented flood damages of over $1 billion, brought irrigation to over 200,000 acres of land, and attracted many millions of visitors.

Associated Projects of Other Agencies

Storage requirements for flood control in the entire Missouri Basin are fulfilled in part by Bureau of Reclamation's Montana installations—Tiber and Yellowtail Reservoirs.

Tiber Reservoir, on the Marias River north of Great Falls, has a capacity of 400,000 acre-feet for flood control and 363,000 acre-feet for conservation, including irrigation.

Yellowtail Reservoir is a multipurpose project on the Bighorn River near Hardin. It contains space for 500,000 acre-feet for flood control.

Surveys Underway

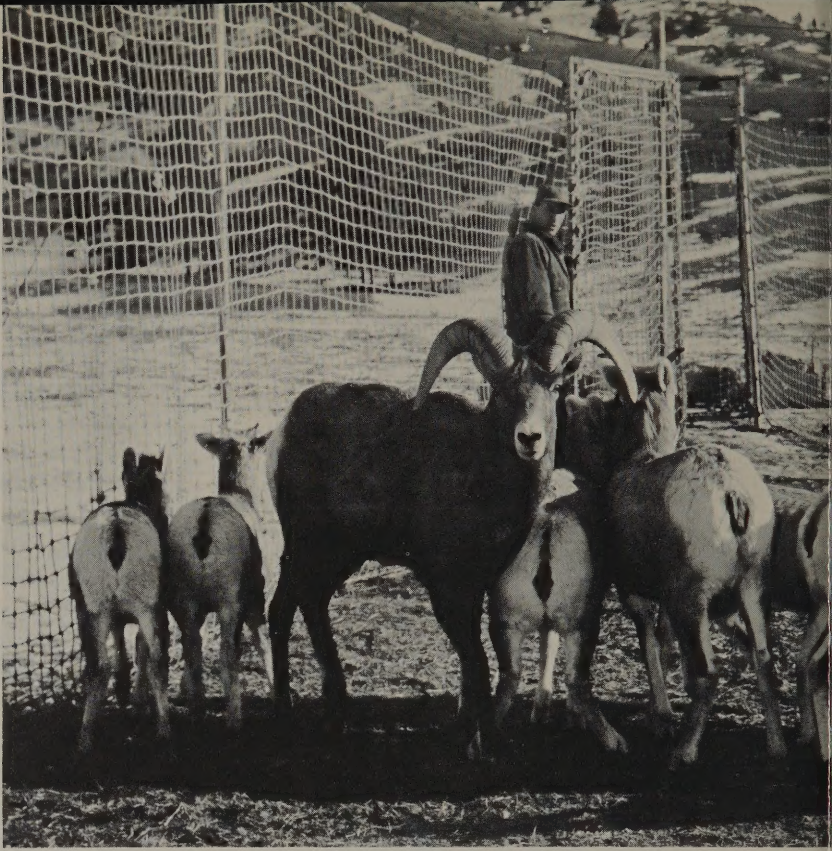
At the request of residents of specific areas, the Corps of Engineers also conducts a program of examinations and surveys to study possible projects in areas where improvements might be effected.

Authorized survey reports include the Missouri River Basin above Fort Peck Dam; Missouri River from Garrison Dam to Fort Peck Dam; Beaver Creek, Milk River Basin; Jefferson, Madison, and Gallatin Rivers; and the Flathead River near Kalispell.

Bonneville Power Administration

The Bonneville Power Administration, a bureau of the Department of the Interior and marketing agency for power generated by the Columbia River System, obtains nearly 1 billion kilowatt-hours of the total annual electric generation in Montana of about 7 billion kilowatt-hours. Even though Bonneville power is marketed only in that part of the State west of the Continental Divide, almost 2 billion kilowatt-hours of power are sold annually, bringing revenues of about $4 million.

The only Federal hydroelectric project of the Columbia River System in Montana is Hungry Horse Dam, constructed by the Bureau of Reclamation on the South Fork of the Flathead River. Bonneville Power Administration operates about 450 miles of transmission lines and provides electrical service through 11 switching stations and substations to 5 cooperatives, 1 Federal agency, 2 private utilities, and 2 industries. This is a plant investment in excess of $20 million.



Bighorn sheep are among animals protected by the Federal-Aid Restoration program. These have been trapped for transportation to a more favorable habitat.

Fish and Wildlife Service

The Department of the Interior's Fish and Wildlife Service, consisting of the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries, manages four national fish hatcheries and several national wildlife refuges and conducts studies contributing to the conservation and development of the fish and wildlife resources of Montana. Migratory bird management responsibilities include law enforcement, population surveys, and banding.

Under the Fish and Wildlife Coordination Act, the Service coordinates development of fish and wildlife with other features of Federal water resource development projects. The Service's Bureau of Sport Fisheries and Wildlife conducts studies and prepares reports on projects of the Corps of Engineers, Bureau of Reclamation, and the Department of Agriculture, and also investigates projects of other organizations developed under Federal license or permit. The Bureau likewise maintains liaison with the Bureau of Public Roads in the Department of Commerce and with the State to advise on fish and wildlife matters related to the Federal-aid highway program and is responsible for the program of survey and preservation of wetland wildlife habitat.

Federal-Aid Programs

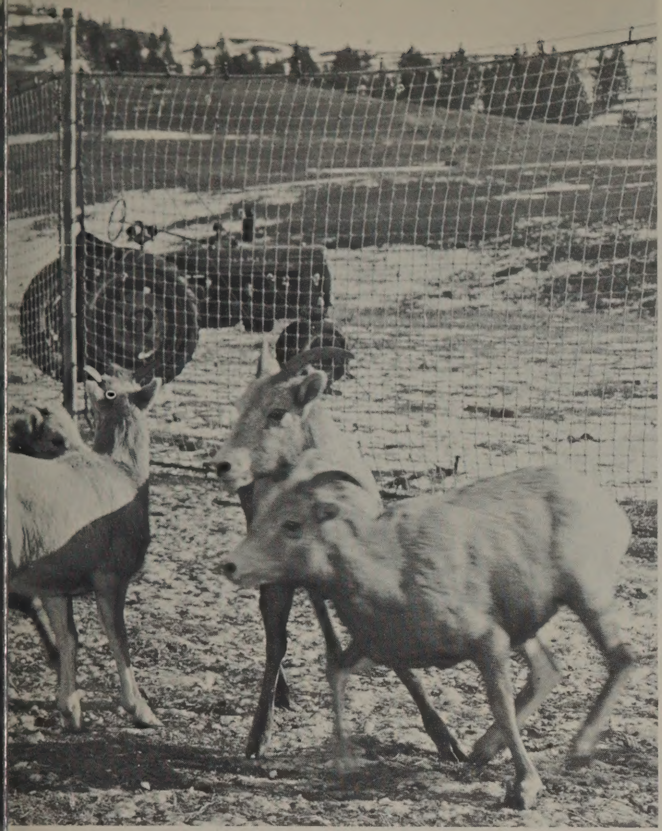
A general survey of the physical, chemical, and biological characteristics of major fishing waters, investigation for development of fisheries management plans for major river drainages, specific management problems, and evaluation of ranch pond stocking policies of eastern Montana are all part of the Montana Federal-aid-to-fisheries program. Funds are provided at the rate of about $125,000 per year.

Montana is divided into seven wildlife management districts. In addition, three other projects, including big game, upland game, and fur resources, have been set up to handle specific management problems.

Mountain goat, mountain sheep, turkey, and chukar partridge programs have been underway for several years. Land acquisition for waterfowl management and big game range continues. Federal aid to wildlife programs average over $400,000 annually.

Predator and Rodent Control

A predator-control program is conducted in cooperation with the Montana Livestock Commission, Montana Fish and Game Department, Montana Wool Growers' Association, and 52 county administrations. Principal predators are coyote, bobcat and stock-killing bears.



Fishery Management

Fishery management services are provided several of the Indian tribes including the Blackfeet. Surveys of reservation waters and plans for fish stocking and habitat improvement have been made with the two-pronged objective of increasing public recreational fishing and tribal revenues.

The Bozeman, Ennis, and Creston National Fish Hatcheries are devoted to the production of trout while the Miles City National Fish Hatchery produces bass, sunfish, channel catfish, and walleye and northern pike to help manage farm ponds and other warm-water impoundments in Montana and neighboring States.

National Wildlife Refuges

Montana's national wildlife refuges are of great importance to the region and the Nation. Benton Lake National Wildlife Refuge, near Great Falls, is rated one of the best waterfowl production areas, acre for acre, but only when water from natural runoff has been periodically available. Through recent construction of canals and other water control facilities, water will now be available for this area on a more permanent basis.

Bowdoin National Wildlife Refuge, near Malta in northern Montana, provides nesting grounds for large numbers of ducks and geese and is a focal point during migration. Woody Island on the refuge attracts a large nesting population of pelicans.

The Charles M. Russell National Wildlife Range, formerly known as the Fort Peck Game Range, has provided substantial benefits to waterfowl as a result of lands made available by the Corps of Engineers. The range is administered by the Bureau of Sport Fisheries and Wildlife and supports a wide variety of Great Plains wildlife, including mule and white-tailed deer, elk, bighorns, prairie chickens, sage grouse, antelope, and interesting prairie dog towns. It occupies the bottom lands, surrounding uplands, and so-called badlands on a 200-mile primitive stretch of the Missouri River.

Medicine Lake National Wildlife Refuge was originally developed to improve the water supply by diverting Muddy Creek. Dikes, built later on tributary streams, have developed marshy areas where mallards, pintails, gadwalls, teal, redhead, canvasbacks, and ruddy ducks nest and raise their young. A transplant of Canada goose goslings several years ago has been a marked success.

The National Bison Range, 40 miles north of Missoula, maintains a foundation herd of 350 bison. A limited number of elk, white-tailed deer, mule deer, pronghorns, and bighorns also finds a home here.

Ninepipe and Pablo Refuges, north of the Bison Range, serve as nesting areas and attract a sizable population of waterfowl during migration

Red Rock Lakes National Wildlife Refuge in southwestern Montana was established primarily for the benefit of the trumpeter swan, an endangered species which in 1935 had a total U.S. population of only 73. Present population of the trumpeter in the Rocky Mountain region is approximately 700.

Designated sections of most of the refuges are open to public hunting and fishing.

A complete list of Montana refuges, their locations, acreage, number of employees, average annual cost, and purpose, is available from the Fish and Wildlife Service, Department of the Interior, Washington, D.C., 20240.

Forest Service

Helena National Forest, one of 11 National Forests in Montana.

The Forest Service, U.S. Department of Agriculture, administers nearly 20 million acres of land in Montana, most of it in the western half of the State. In addition, the Forest Service cooperates with the Montana State Forester in programs for the management and protection of State and private forest lands, and engages in research activities through Montana field offices of the Intermountain Forest and Ranges Experiment Station to keep the forest lands at their most productive state.

National Forest Administration

The Regional Forester in Missoula is responsible for administering 11 national forests in Montana, six of which are entirely in the State, and five of which overlap from headquarters in neighboring States. A supervisor and a staff aid the regional Forester in administering each forest. These national forests are managed to sustain their many resources—timber, rangeland, recreation opportunities, water, and wildlife.

Timber harvesting and the manufacture of forest products are among Montana's leading industries, and her 16.6 million acres of national forest land include more than 10 million acres of commercial timber. Heaviest growth is ponderosa pine, Douglas-fir, and Englemann spruce. These forests produce a high proportion of the Nation's Christmas trees.

Total timber cut on the national forests of Montana amounts to 561 million board feet annually, valued at over $4 million.

Range Resources

In a State justly famous for its ranches, these same national forests provide summer range for 120,000 head of cattle and 160,000 sheep and goats. In these forests there is an abundance of game and game range. The nearly 2 million acres of wilderness areas provide isolated recreational hunting and fishing of exceptional quality.

Hunting is permitted in all national forests, providing that the State hunting regulations are observed. Some 63,000 big-game animals—mostly deer, elk, and bear—are hunted yearly.

In recent years it has been necessary to intensify management and protection activities to avoid serious deterioration of national forest resources and facilities. Under the "Development Program for the National Forests," the Forest Service plans developing and managing forest resources to meet demands anticipated by the year 1972 and including long-term planning up to the year 2000.

For Montana, plans underway include: planting of 141,000 acres of trees; construction of 480 camps and picnic areas; revegetation of 155,000 acres of range with construction of 728 miles of fence and 525 water developments for range purposes; control of erosion and stabilization on 18,000 acres and 1,300 miles of gullies and roads;

construction of 12 pollution-control and flood-prevention projects; reduction of hazardous fuels on 83,000 acres and construction of 200 miles of firebreaks; and construction of 5,714 miles of multipurpose roads and 1,148 miles of trails.

State and Private Cooperation

The Forest Service works with State agencies on many programs involving the protection and management of State and privately owned lands. Among these programs are fire control, forest pest control, watershed protection and flood prevention, distribution of planting stock, and assistance in forest management. The Forest Service provides financial, technical and planning assistance to the State board of lands and investments, which administers these programs in Montana through the State Forester.

The past few years have seen an intensification of effort to control forest insect pests, and annually approximately 111,000 acres of State and privately owned lands are sprayed or otherwise treated under Forest Service auspices.

Research

The Forest Service conducts research projects in Missoula and in Bozeman to determine new and better methods in silviculture, pest control, range and watershed management, and control of forest fires.

At Missoula, Project Skyfire is conducted at the Northern Forest Fire Laboratory. With the aid of wind tunnels, radar and other devices, Forest Service scientists have undertaken pioneer work in the study of fire-starting lightning storms and their control. A special study has been undertaken to develop guides for the selection and application of firefighting chemicals.

Other Forest Service research in progress from the Missoula office includes a silviculture study of western larch and its propagation and a study of the most effective methods for combating the western pine beetle.

At Montana State College in Bozeman, Forest Service scientists are doing notable work in range management and wildlife habitat research. Here also the Forest Service, in cooperation with Montana State College, has instituted a program in forest engineering research, involving the problems inherent in growing and marketing timber from the steep slopes of the region. The center of Bozeman was initially established as headquarters for a silviculture study of lodgepole pine, determination of the effect of stand density on growth, yield and site quality evaluation—and especially for research on the regeneration of certain problem cutting areas.

A forest Ranger discusses range management plans with a sheepman in Lolo National Forest.

Geological Survey mapping projects aid in development of the State's mineral resources.

Geological Survey

The Geological Survey of the Department of the Interior is conducting a wide variety of geophysical, geologic, and geochemical studies in Montana. Some of these are aimed at increasing knowledge of many different mineral and mineral fuel resources, and providing data to aid the solution of engineering problems. Other studies contribute to understanding of the composition, structure, and history of the rocks of the State.

Several studies in Montana are in areas known or suspected to contain useful minerals or mineral fuels, such as the iron ore and phosphate-bearing areas of southwestern Montana, the Philipsburg district of manganese-bearing rocks, the Thunder Mountain niobium area, and the Winnett-Mosby area and Williston Basin, important sources of oil and gas. Studies in the Great Falls, Wolf Point, and Fort Peck areas are providing data on construction materials and other geological aspects of engineering programs.

Geologic and related studies in other parts of the State unravel a variety of local and regional problems of geology and geologic processes. Areas and topics studied are the rocks and structure of the Boulder batholith and Elkhorn Mountains areas, the geologic and glacial features of Glacier National Park, the detailed mineralogy of the chromite-bearing rocks in the Stillwater complex, and the geochemistry and metamorphism of the ancient sedimentary rocks in the Belt series of western Montana.

Many of these studies are supported by aeromagnetic and gravity surveys to provide additional information about the structure and character of rocks at depth. Regional analyses of sedimentary rocks and their fossils help to clarify the history of geologic events.

Water Resources Investigations

The Geological Survey determines and describes the availability and quality of the water resources of Montana, on the surface and underground, whether under natural conditions or under conditions of present or potential development and use by man. Investigations are planned specifically to obtain facts needed to solve water problems relating to distribution, supply, quality, floods, and variability.

Basic facts on streamflow are continuously collected by the Geological Survey at about 200 sites in Montana. Water-sampling stations for monitoring the chemical and physical quality of the State's waters number approximately 15. Ground-water levels are regularly or continuously observed at about 20 key wells. Observations of stage and contents are regularly obtained at 55 reservoirs. Appraisals of ground-water sources are underway in several areas.

Other area and interpretive studies concern peak floodflow characteristics of small drainage areas, relation of ground-water levels to base streamflow; hydrology of glaciers; flood magnitude in the Columbia River Basin; land-water-plant and erosion sediments; hydrology of range water development on the public domain; relation of streamflow, suspended sediment, and water temperatures to fish; and on scour and fill.

Much of the water resource investigation by the Geological Survey is carried out in cooperation with State and other Federal agencies.

Mapping

Following the rapid expansion of Montana after the discovery of rich mineral resources, small-scale mapping at 1:125,000 (1 inch equals nearly 2 miles) and 1:61,500 (1 inch equals nearly 1 mile) was considered adequate to chart the vast unmapped area. But, with the great abundance of natural resources and the development of improved mining methods, more detailed 1:24,000-scale (1 inch equals 2,000 feet) maps prepared by photogrammetric methods are needed today.

Approximately 39,000 square miles or 27 percent of the State is covered by Federal 7½- or 15-minute topographic maps. With more precise and efficient map compilation methods, the long-range plan is to have the entire State mapped in either the 7½- or 15-minute scale by 1976. About 19,000 square miles of mapping are in progress in Montana. The State is completely covered with 1:250,000-scale maps (1 inch equals nearly 4 miles), most of which were photogrammetrically compiled.

Conservation Activities

The Conservation Division's Branch of Mineral Classification is mapping and classifying mineral land. In addition, the classification of withdrawn coal land in certain areas is being completed. Approximately 450,000 acres of withdrawn public mineral land have been classified or are nearing classification.

Numerous reports on oil and gas discoveries are made by Branch of Oil and Gas field personnel to headquarters in Washington to assist in the leasing of Federal oil and gas lands. Known geological structures of producing oil and gas fields recently defined include the Elk Basin, Flat Coulee, Keg Coulee, and West Coulee fields.

Other projects of Conservation Division branch geologists in Montana are: preparation of a report on mineral and water resources; reports on damsites of the Lower Flathead River; study of economic geology of the Missouri River from the head of Fort Peck Reservoir to Morony Dam; a structure contour map of the Dwyer-Grenora Area, Montana and North Dakota.

Branch activities are conducted from the office of the Regional Geologist in Great Falls.

Information on current geologic work of other organizations in Montana may be obtained from the Montana Bureau of Mines and Geology, Montana School of Mines, Butte, Mont.

The Bureau of Indian Affairs conducts many programs in Montana. Dancers don colorful costumes for Annual North American Indian Day's celebration in Browning.

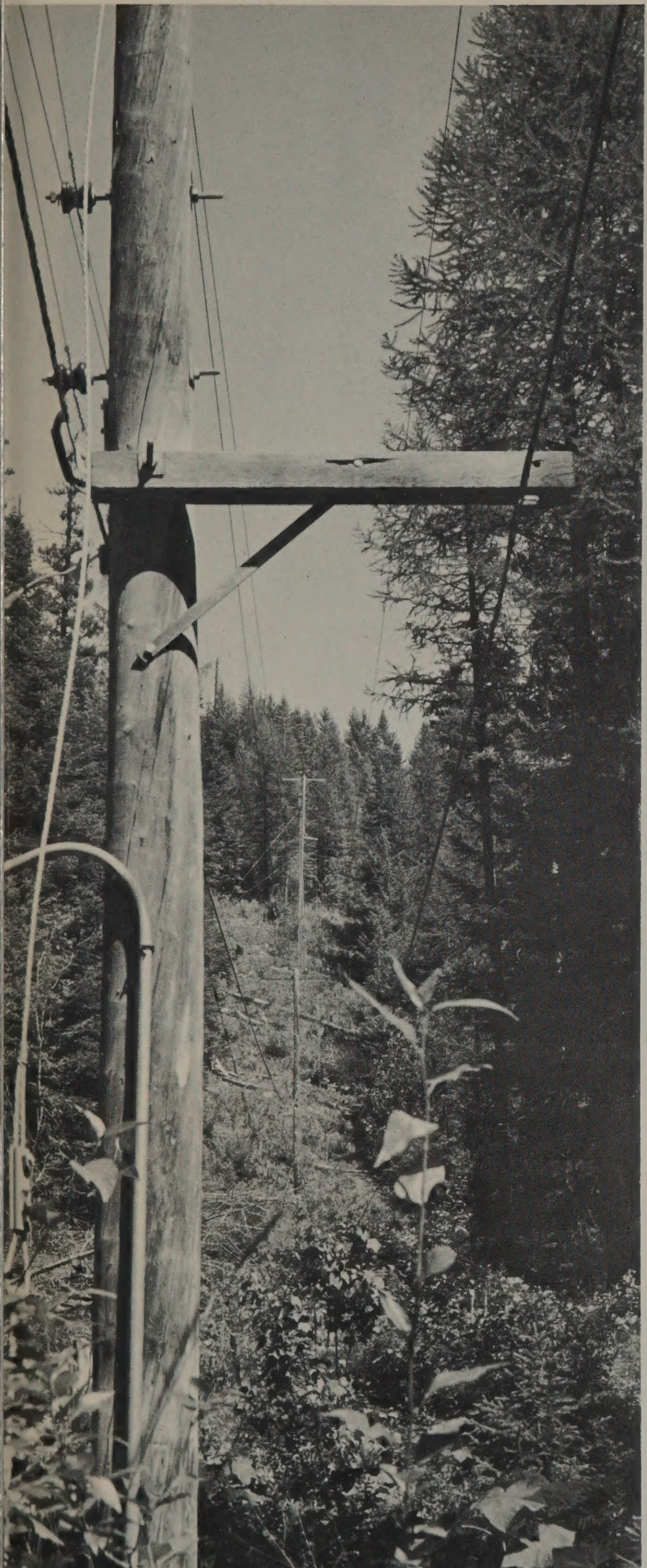
Bureau of Indian Affairs

In addition to helping the Indians of Montana in the conservation, development, and effective use of various Indian-owned resources, the Bureau of Indian Affairs of the Department of the Interior conducts numerous programs in their behalf.

These include assistance in the industrial development of the reservations; construction and maintenance of roads serving reservation areas; the provision of credit to finance economic enterprises; assistance in adult vocational training and relocation for employment; welfare, social services, and counseling in the use of funds; assistance in sound soil and moisture conservation measures; and financial aid through the State department of education for educating Montana Indian children in the public school system.

The Bureau also conducts an adult education program on several reservations.

Bureau programing is on a reservation or community basis, so that each course of action is individualized in terms of tribal customs, traditions, problems, organization, past history of relations with the Federal Government, and tribal and personal goals. The broad objective of the Bureau's program is to assist Indians obtain the full privileges and responsibilities of American citizenship; the technique is to help the Indians help themselves.



Bureau of Land Management

The Bureau of Land Management of the Department of the Interior is responsible for the conservation, management, and development of some 465 million acres of the Nation's public domain lands. Approximately 8 million of of these acres are scattered throughout Montana. The Bureau also administers 2 million acres of lands which were acquired by the Government under the Bankhead-Jones Act.

Over 5 million acres of the land in the public domain in Montana lie within grazing districts established under the Taylor Grazing Act of 1934. Public domain land in Montana also is used for timber production, mineral production, recreation, and wildlife habitat.

The Bureau of Land Management is also responsible for surveying and marking the public land and for classifying it according to best use. The Bureau's duties include timber management; range management and rehabilitation; fire protection; insect and disease control; construction of roads, bridges, and water control devices; selective disposition of the land; and maintenance of the public land records.

Bureau of Land Management functions in Montana are accomplished by a State director and his staff in the State Office in Billings, where

The Bureau of Land Management administers more than a half million acres of commercial timber lands in Montana, carrying out a strong forest protection program.

Clear, cold waters, excellent for fishing, abound in Montana areas administered by the Bureau of Land Management.

current and historic public land records for Montana and the Dakotas are kept.

Rangelands

Most of the public domain in Montana is best suited for livestock and wildlife grazing. Over 620,000 cattle and horses, about 680,000 sheep and goats, and nearly 160,000 big-game animals forage on this land annually. When range is allotted, provision is made also for safeguarding wildlife habitat.

Forest Management

Approximately 648,000 acres of commercial timber lands in Montana are administered by the Bureau of Land Management. The annual producing capacity of this resource on a sustained yield basis is 23.9 million board feet. During a recent year, an equivalent of nearly 12 million board feet of timber was harvested from public lands in the State. An inventory of the forest resources will serve as the basis for formulating long-term management plans for regulating harvest on a sustained-yield basis. An important phase of forest management in Montana is the protection of the resource from the ravages of fire, insects, and disease. An aggressive protection program is being carried out by the Bureau in Montana.

The Bureau of Land Management works to prevent further deterioration of surface resources by wind and water erosion, fire, insects, weeds, and man, and to increase forage production and enhance uniform range use, eliminate worthless plants and trees, and generally maintain the public domain lands in the best possible condition. To reduce the rapid runoff rate of water and sediment and to permit more water to soak into the soil, the Bureau constructs water-spreading systems.

Reseeding is often done by plane or helicopter in areas where brush has been pulled off with chains, sprayed or plowed under. In a recent year, over 3,000 acres were reseeded.

Recreation Program

Although the general public has for many years used its public domain extensively for recreation, only in the past few years has recreation received the same degree of attention as the more traditional resources—range forage, commercial timber, and minerals.

The Bureau is maintaining an inventory of the public domain to identify and delineate areas possessing significant public recreation values. In some cases, BLM continues to administer the recreation sites as they are developed. However, State and local agencies manage certain land themselves.

The Bureau's duty in facilitating recreation use (principally hunting) on the large expanses of public land is recognized by the Taylor Grazing Act, but the problem of legal and physical access, fragmentary land patterns, and lack of public knowledge of the land's existence and location has severely hampered such use. The Bureau has embarked on a long-range effort to help alleviate this situation.

Disposition of public lands can be made under the Recreation and Public Purposes Act. Under this act and related laws, public lands may be purchased or leased for recreation or other public purposes by State and local governments and qualified nonprofit organizations. To encourage the use of the act, the Secretary of the Interior has established a purchase price to State and local governments of $2.50 an acre. The annual rental fee is 25 cents an acre.

Other Functions

The largest revenue returned to the State by BLM comes from oil and gas leasing on the public land.

One of the Bureau's most important responsibilities is the orderly transfer of land ownership under such laws as the public sale law, the Small Tract Act, and Recreation and Public Purposes Act. Before any land can be transferred it must be classified to make sure it is suitable for the purpose for which the application is made.

Intensive resource management programs in many areas are being carried out by BLM. Generally the lands are managed in close cooperation with the various other public and private agencies which are also concerned with the land or its resources.

Public domain in Montana supplies forage for more than a million cattle and horses.

This iron- and titanium-bearing formation in Glacier County has been studied by the Bureau of Mines to find new methods to develop it.

Bureau of Mines

Activities of the Department of the Interior's Bureau of Mines benefit the mineral industries and the people of Montana in three fundamental ways: The Bureau gathers and publishes economic and technological information that is useful in developing and conserving the State's mineral resources; it conducts research to devise new scientific and engineering techniques that can be applied in Montana or that will help develop new uses for minerals found in Montana; finally, the Bureau provides coal mine inspection and educational services designed to promote safe and healthful working conditions in Montana's mineral industries.

Bureau specialists cooperate with representatives of the Montana Bureau of Mines and Geology in collecting and publishing statistical and economic information on the State's mineral products. The Bureau also works closely with other Department of the Interior agencies, such as the Bureau of Reclamation and the Bonneville Power Administration, providing information and counsel as to the effect of proposed dams and reservoirs on development of mineral resources.

Although the Bureau of Mines has no installations in Montana, it conducts many studies each year that yield information on Montana's mineral deposits. Engineers headquartered at the Bureau's Office of Mineral Resources in Spokane, Wash., bring mobile laboratories and other up-to-date equipment into the Treasure State to examine and evaluate potential sources of such space-age metals as beryllium, cesium, columbium, rubidium, and lithium. Relatively large Montana deposits of iron, tellurium, phosphate rocks, tungsten, and titanium have been investigated by the Bureau to determine the factors, such as mining, milling, and transportation, that govern their economic development.

Similar studies, supplemented by mining and metallurgical research carried on at Bureau installations in other States, are providing knowledge of new techniques and processes that should make possible more effective utilization of Montana's huge reserves of lean, or lower grade ores and its resources of bituminous and subbituminous coal and lignite.

Bureau laboratories in San Francisco, Calif., Laramie, Wyo., Bartlesville, Okla., and Morgantown, W. Va., supply information to assist Montana's growing oil and natural gas industries.

Each Montana coal mine is visited periodically by a Federal coal mine inspector who advises mine officials and workmen on methods for improving safety in general and for eliminating specific hazards that could lead to a disaster. Bureau inspectors and health and safety engineers also visit metal and nonmetal mines to provide instruction in first aid, accident-prevention, and mine rescue techniques for workers and supervisors.

National Park Service improvements enhance visitor opportunities to enjoy such scenery as this in Yellowstone National Park of Montana, Wyoming, and Idaho.

National Park Service

Under a long-range program of development of areas in the National Park System, the Department of the Interior's Park Service is moving forward in its improvement plans for Montana areas. Tourists are finding more and more trails and campsites designed to assist visitors at Glacier National Park. Construction of buildings in Glacier and West Yellowstone Airport, and roads and trails in the Montana section of Yellowstone National Park is part of this program.

Other Park Service conservation and development programs in Montana include a major road construction program in Glacier; information center with exhibits at Logan Pass; improvements at Avalanche Fish Creek, Rising Sun, and Bowman Lake Campground; and a terminal building, utilities, and landscaping at the West Yellowstone, Montana Airport.

The real accomplishments of the Park Service's long-range programs are measured, not by miles of new roads, increased capacities of lodges, campgrounds, or by the number of new public buildings, but by how well the program as a whole accomplishes the purpose of national parks—to preserve the Nation's heritage in wild lands, scenery, and historic treasures for the enjoyment and inspiration of Americans.

The Bureau of Outdoor Recreation lends planning and survey assistance in developing recreational potentials in Montana.

Bureau of Outdoor Recreation

While the Bureau of Outdoor Recreation manages no land, its functions are of significance to the citizens of Montana and to tourists because such functions serve to increase the supply of outdoor recreation opportunities in the State.

The Bureau, part of the Department of the Interior, provides technical services and planning and survey assistance in outdoor recreation to States and local governments. It also assists in preparation of standards for statewide recreation plans and, upon authorization by Congress, will administer Federal financial grants-in-aid for State recreation planning, acquisition, and development.

The Bureau was established in the Department of the Interior by order of Secretary Stewart L. Udall in the spring of 1962. It correlates related outdoor recreation programs of the various Federal agencies and bureaus operating in the State; is responsible for formulating a nationwide outdoor recreation policy and plan based on State, regional, and Federal plans; sponsors and conducts recreation research, and encourages interstate and regional cooperation in outdoor recreation projects. It also works on other projects assigned by the Secretary of the Interior and by the President's Cabinet-level Recreation Advisory Council.

Montana has named the chief director of recreation and lands development, Montana Fish and Game Department at Helena, as a point of contact to work with the Bureau in future State-Federal recreation planning and development.

Bureau of Reclamation

Three major types of agricultural use are practiced in Montana—irrigated land, grassland, and dry land. The irrigated area consists of about 1,750,000 acres. Of that total, about three-fourths are in the Missouri River drainage area, and one-fourth in the Columbia River drainage area. The Bureau of Reclamation has constructed in Montana irrigation facilities serving 12 projects having a total irrigable acreage of 340,500. Nine of the Reclamation projects are in the Missouri River drainage area, and three projects are in the Columbia River drainage.

Montana is one of the Western States in which work leading to construction was first done under the provisions of the Reclamation Act, signed by President Theodore Roosevelt in 1902. In 1903, five irrigation projects in the West were authorized; one of these was the Milk River Project in northern Montana, which has since developed to serve 120,000 acres, the State's largest Reclamation irrigation development. Other pioneer Bureau of Reclamation irrigation projects in Montana are the Sun River Project near Great Falls and the Huntley Project near Billings and the Lower Yellowstone Project, both in the Yellowstone River Valley. About one-third the Lower Yellowstone Project acreage is in North Dakota. Also in the Lower Yellowstone River Valley of Montana, Reclamation has developed the 22,938-acre Buffalo Rapids Project and the 881-acre Intake Project. In western Montana, Reclamation has developed the Bitterroot Project, the Frenchtown Project and the Missoula Valley Project, Big Flat Unit.

As a part of the Missouri River Basin Project, the Bureau of Reclamation has constructed in Montana the Savage Unit in the Lower Yellowstone Valley; Crow Creek Pump Unit, near Three Forks, and the Helena Valley Unit. The Helena Valley Unit receives its irrigation water directly from Canyon Ferry Reservoir.

The multiple-purpose Canyon Ferry Unit, consisting of a dam, reservoir, and 50,000-

This huge irrigation conduit is at Clark Canyon Dam, a unit in the Bureau of Reclamation's Missouri River Basin Project.

kilowatt powerplant, is one of the key developments of the Missouri River Basin Project. The unit is on the main stem of the Missouri River, about 58 miles downstream from where the Jefferson, Madison, and Gallatin Rivers join to form the Missouri.

One of the functions of Canyon Ferry Reservoir is to store floodwater to replace the water used for new upstream irrigation, thus maintaining the flows to satisfy prior water rights at downstream powerplants. In the upstream Three Forks Basin is the Bureau of Reclamation's 49,804-acre East Bench Unit.

Other Missouri River Basin Project developments, which may play a part in turning the Reclamation potential of Montana into reality, include:

Three Forks Division—seven units, 66,700 acres of new land, 101,600 acres of supplemental irrigation.

Helena-Great Falls Division—three units, 9,500 acres of new land, 200 acres of supplemental.

Sun-Teton Division—53,200 acres of new land, 3,700 supplemental.

Judith Division—three units, 7,000 acres of new land, 6,000 acres supplemental.

Milk Division—two units, 68,800 acres of new land.

Northeast Montana Division—14 units, 165,400 acres of new land.

Marias Division—one unit, 127,000 acres of new land. (Tiber Dam and Reservoir was completed in 1956, but construction on irrigation distribution system has not been started.)

Lower Bighorn Division—seven units, 61,600 acres of new land, 15,800 acres supplemental. (The multiple-purpose Yellowtail Unit, consisting of a dam, reservoir, 250,000-kilowatt powerplant, switchyard, and afterbay dam, is under construction.)

Yellowstone Division—nine units, 24,200 acres of new land.

Tongue Division—Tongue Pumping Units, 26,100 acres of new land.

Powder Division—Lower Powder Units, 58,500 acres of new land.

Little Missouri Division—one unit, 9,000 acres of new land.

The potential Missouri River Basin Project irrigation developments in Montana will provide water for nearly 677,000 acres of new land and provide supplemental water for 127,000 acres already under irrigation.

Western Montana

There are approximately 288,000 acres of Montana in the Columbia River drainage area which could be irrigated in the future. The greater share of this would be developed in the Clark Fork River Basin. Some 18,000 acres of the potential lie within the Kootenai River Basin.

Future expansion of irrigation in the Columbia River Basin of Montana will be limited by economic considerations and by the land resource rather than by the water supply. One of the economic considerations is the need for adequate low-cost power for irrigation pumping. Such power could be developed by the Federal Government at one or more of the potential large storage sites, such as Knowles, within the Columbia River Basin in Montana.

In western Montana, the Bureau of Reclamation has constructed the Hungry Horse Reservoir with about 3 million acre-feet of multiple-purpose storage on the South Fork of the Flathead River, a tributary of the Clark Fork. The Bureau has also rehabilitated Lake Como Dam on the Bitterroot Project. The balance of irrigation storage in western Montana has been constructed primarily by the Montana State Water Board in a series of small storage facilities.

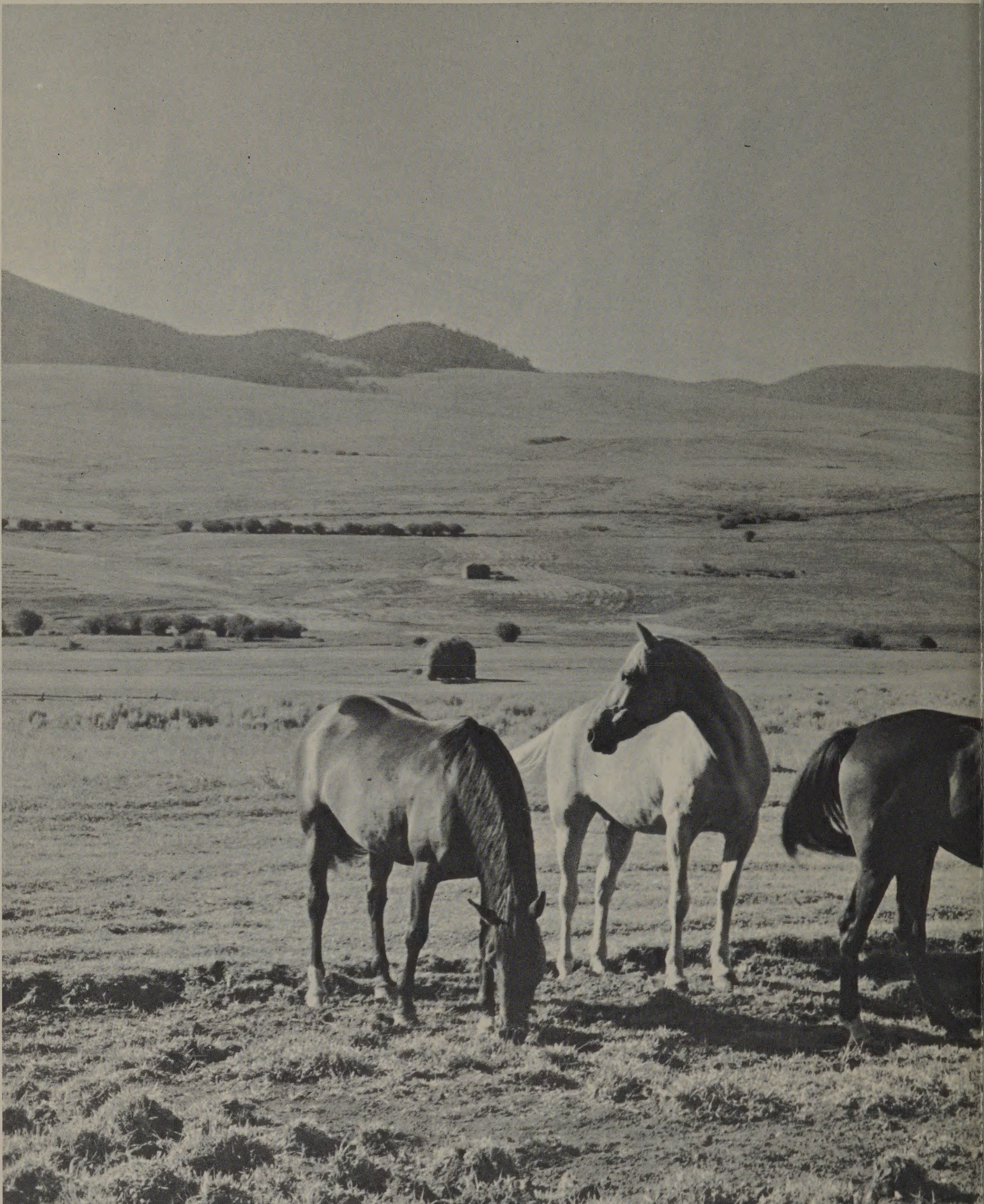
In the Clark Fork Basin, most of the suitable and easily irrigated lands are privately developed, and are served by simple, low-cost diversions. Most of the nonirrigated arable lands occur on isolated remnants of terraces with considerable elevations over adequate sources of irrigation water. Typically, the tracts are too scattered to be served by single-project canal systems. High pumping heads, lengthy discharge lines, and relatively small land bodies cause high per-unit costs on all but a few low-lying compact areas.

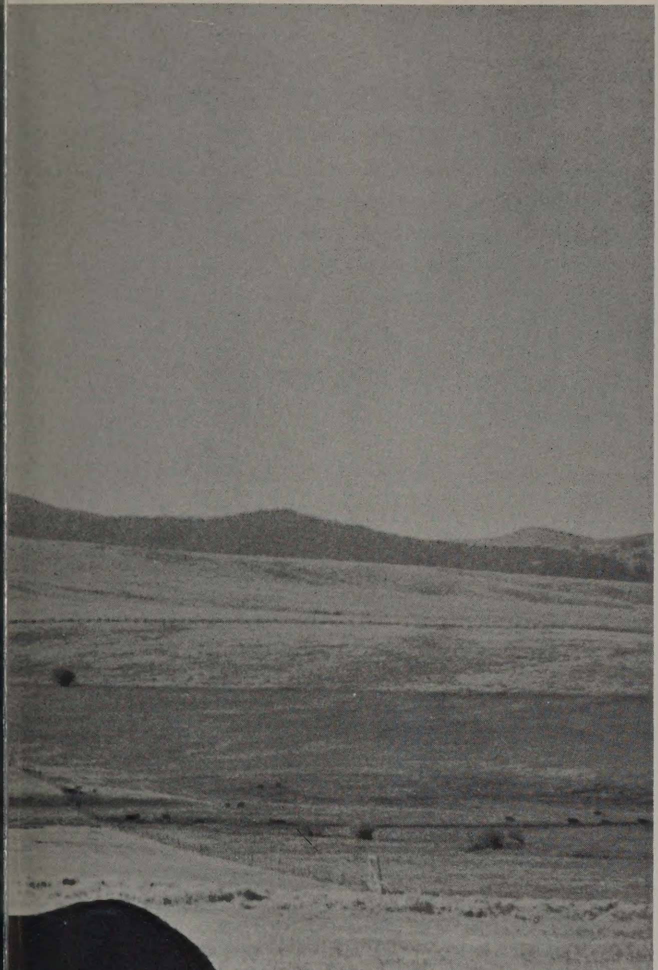
Of the 270,000 arable acres, 223,400 are adaptable to surface or gravity irrigation. Of the

Carefully selected aggregate is used in construction of the Bureau of Reclamation's Yellowtail Dam.

latter, 19,400 acres are pasture class and 20,500 are timbered. There are 46,300 acres that are best suited for sprinkler-type irrigation. Of these, 8,300 have a timber or heavy brush cover.

As indicated previously, most of the easily developed land suited to irrigation is under ditch at the present time. Over the basin as a whole, the limiting factor is lack of nonsuitable land rather than insufficient water supply. Principal nonirrigated arable lands, 58 percent of nonirrigable lands in the entire Clark Fork Basin, are in the Flathead Valley. The remaining acreage consists of smaller, more widely scattered tracts.





The Future

Montana is truly The Treasure State—rich in natural resources of land, water, timber, fish, minerals, and wildlife. It is a land of scenic beauty, abounding in recreational opportunities and blessed with an invigorating climate.

Development of the State has stemmed and will progress from the people of Montana, who know the value of wise conservation, careful management, and rational use of the resources Nature has given them.

Montana has grown from a brawling, independent frontier Territory into a State with a diversified economy. Its future is assured, because the basic resources are at hand for sustaining continued growth.

Federal natural resource agencies have played important roles in building the Big Sky Country, and will continue, in the years ahead, to work for the conservation, prudent use, and development of Montana's endowments.

(Right) Sheep graze in lush grass. More than half the State's cash receipts for agricultural products come from livestock and livestock products.

Acknowledgments

The Department of the Interior is indebted to the following for illustrations appearing on pages as indicated:

Bill Browning, *Montana Chamber of Commerce: 1, inside back cover, 4, 5, 6, 7, 8–9, 11, 15, 16, 17, 19, 20–21, 26* top left, *35, 36* right, *38–39, 40, 41, 42, 56, 66; Helena Chamber of Commerce: 12, 13, 21,* bottom center; *Anaconda Company: 33; Haynes Studios Inc.: 20.*

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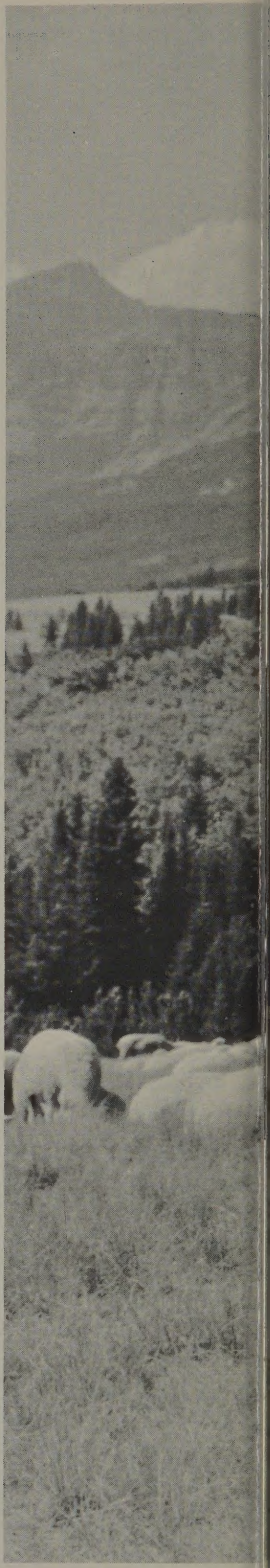

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(Back cover) Massive efforts and around-the-clock work are required to construct multi-purpose dams for conservation and use of Montana's valuable water resources.

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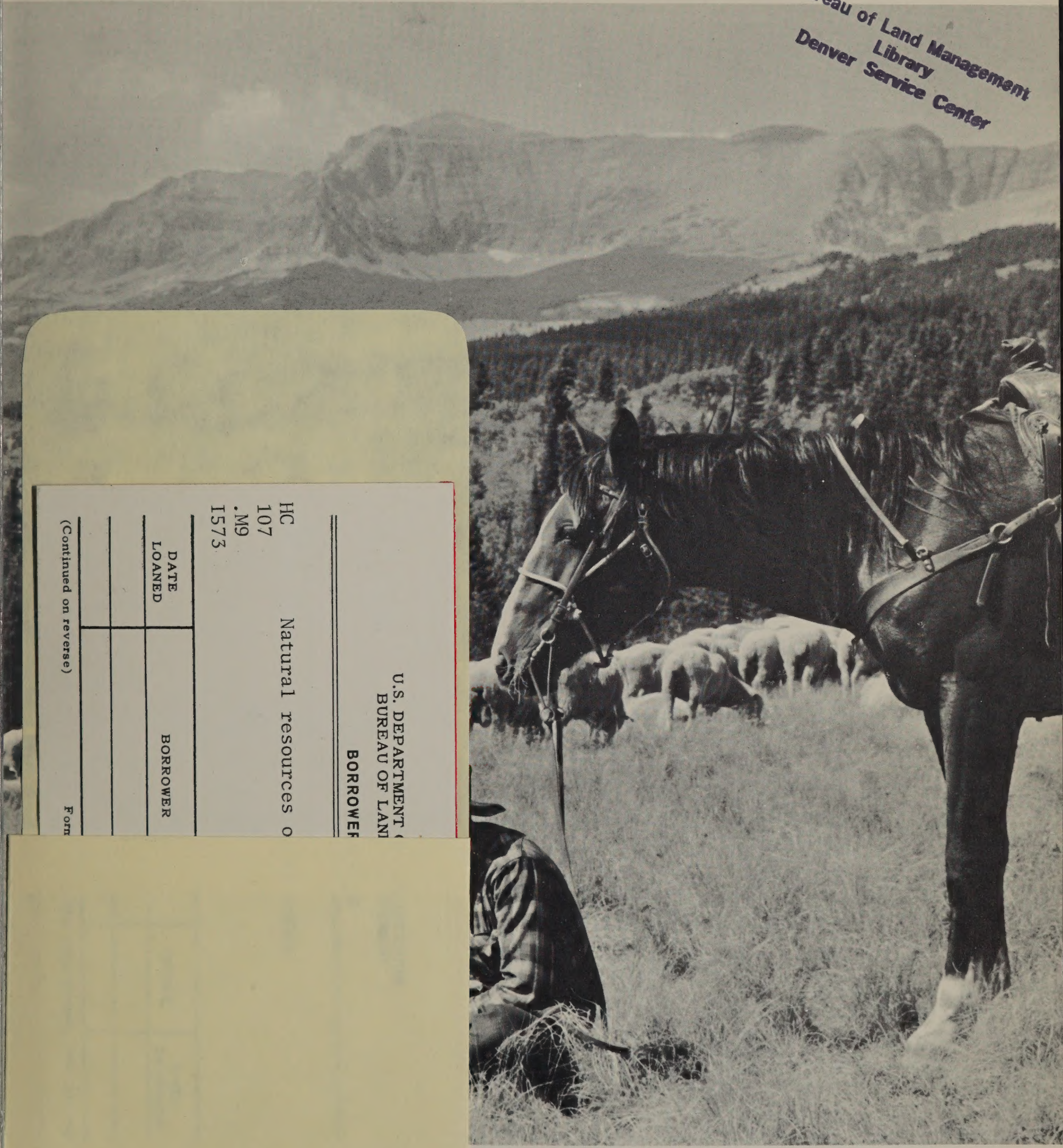

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THE GREAT SEAL OF THE STATE OF MONTANA

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Created in 1849, the Department of the Interior—a Department of Conservation—is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

March 3, 1849